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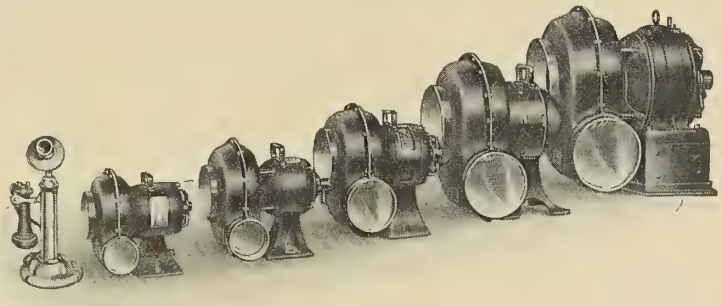

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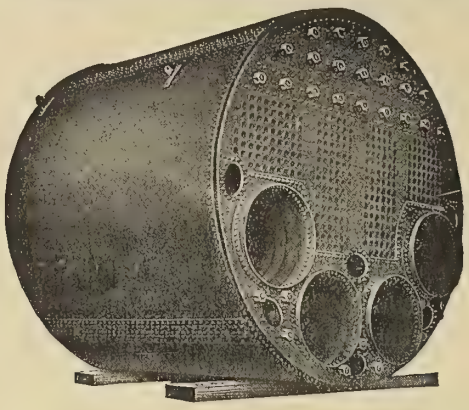

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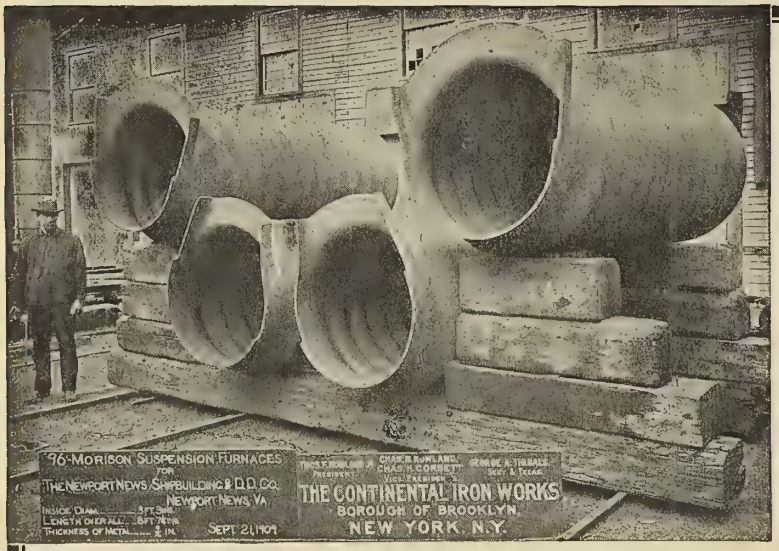
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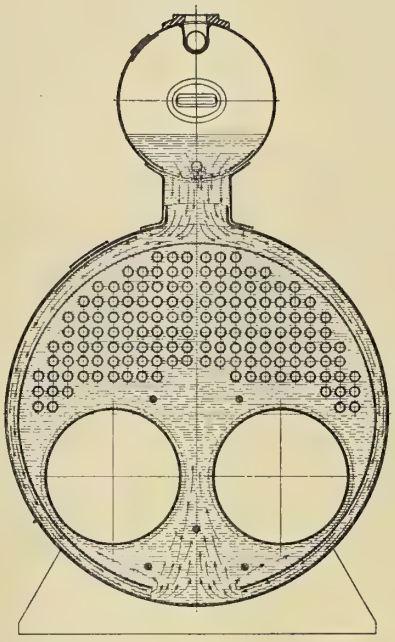

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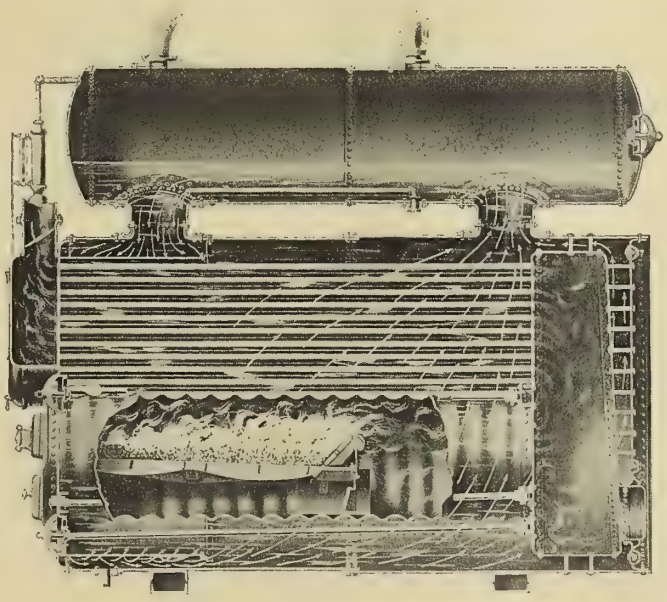

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39-12

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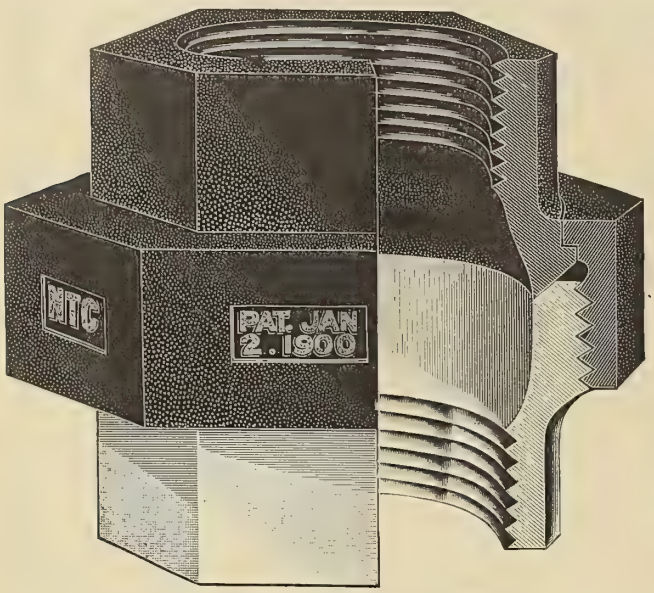

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¶ No engineer should tolerate a leaky union on any line. Most engineers will not, for information about the **"Kewanee"** Union is always ready for even the casual glance.

¶ There are numerous instances of leaking unions in plants throughout the country—perhaps you have some of them.

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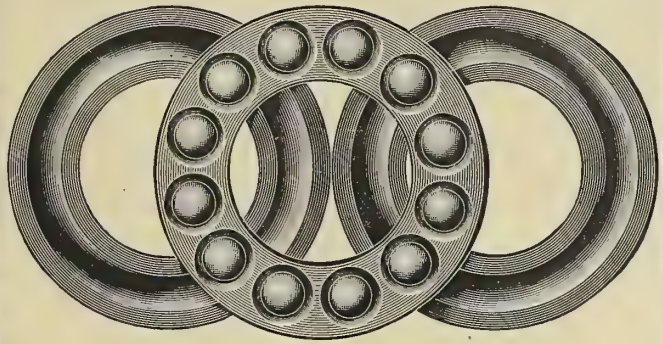

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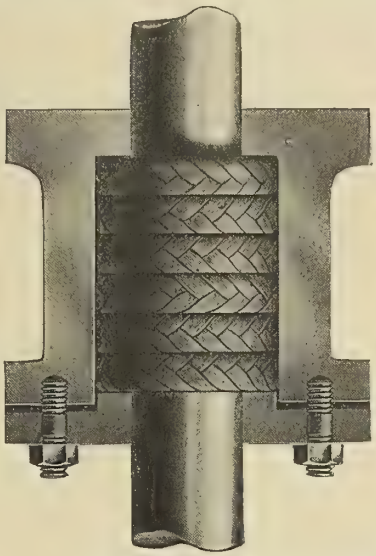

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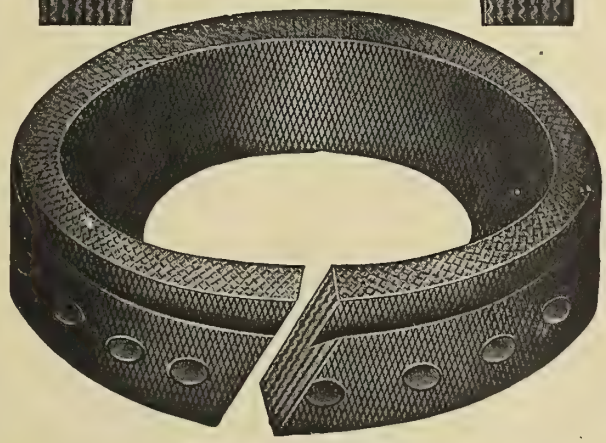

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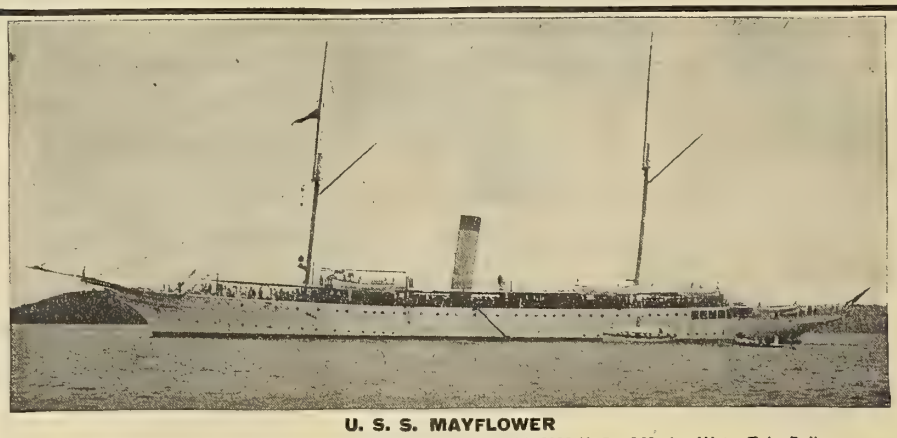

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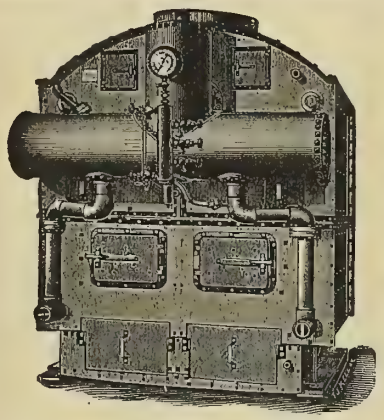

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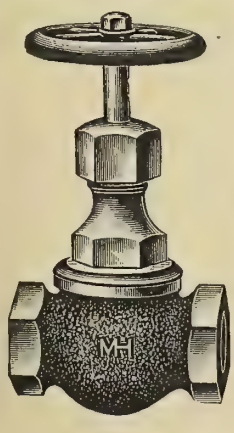

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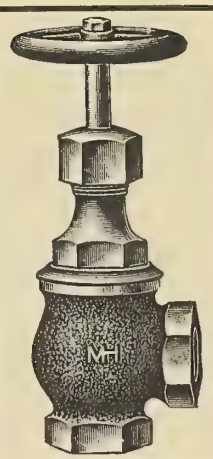

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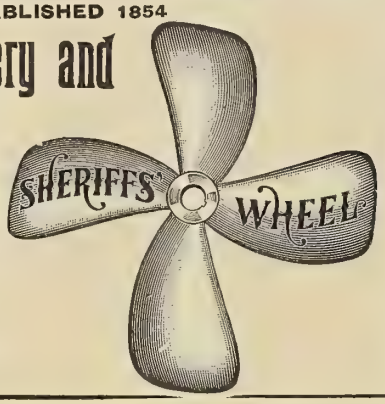

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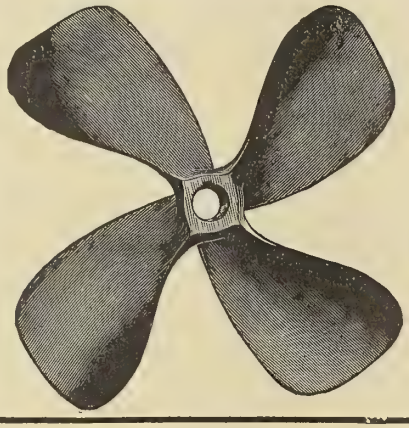

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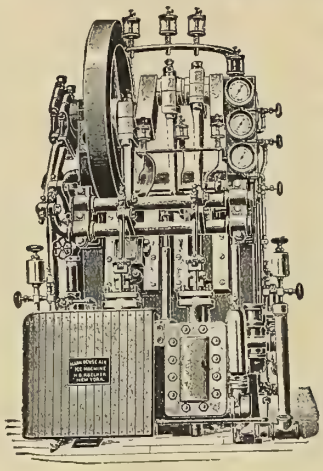

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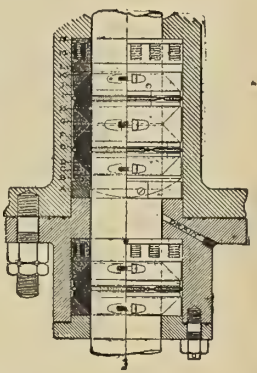

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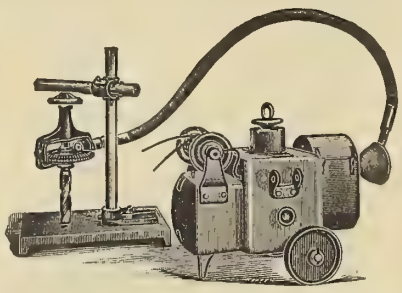

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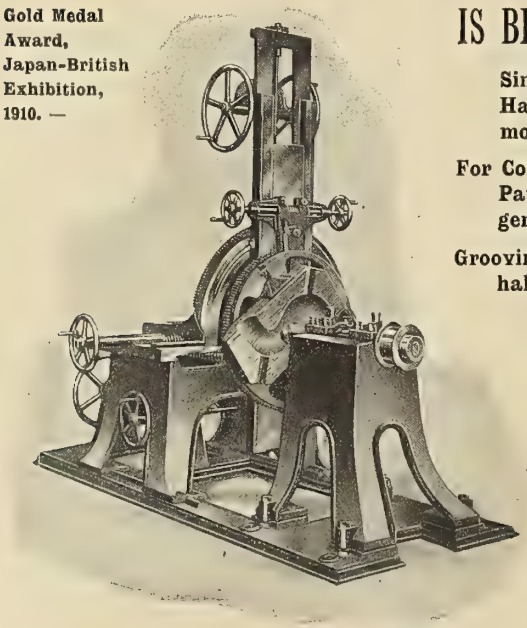

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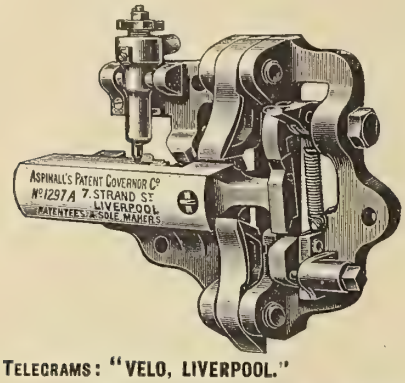

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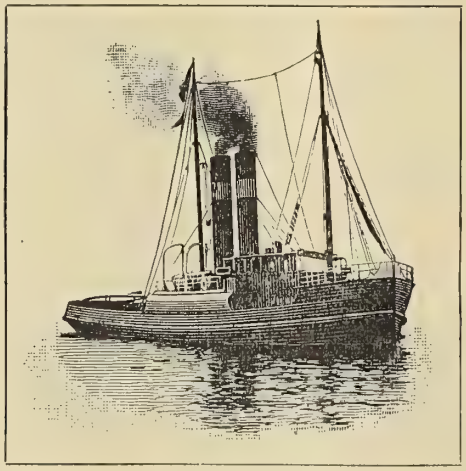

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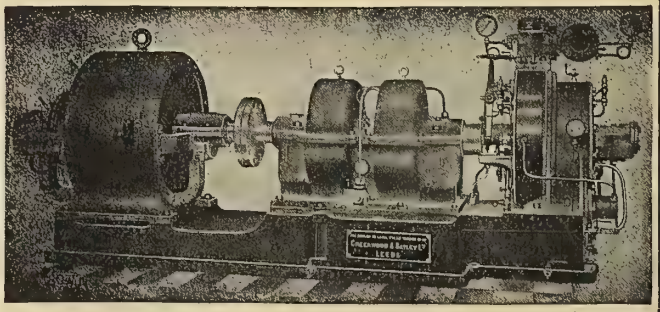

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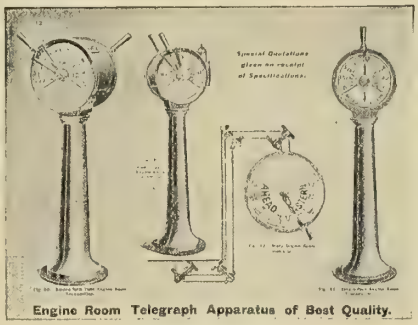

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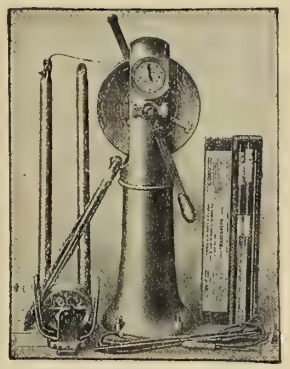

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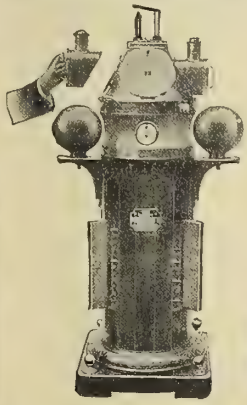

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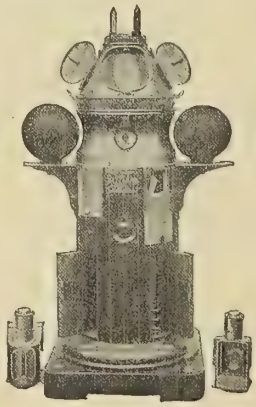

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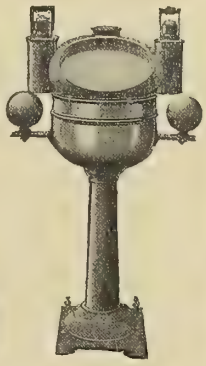

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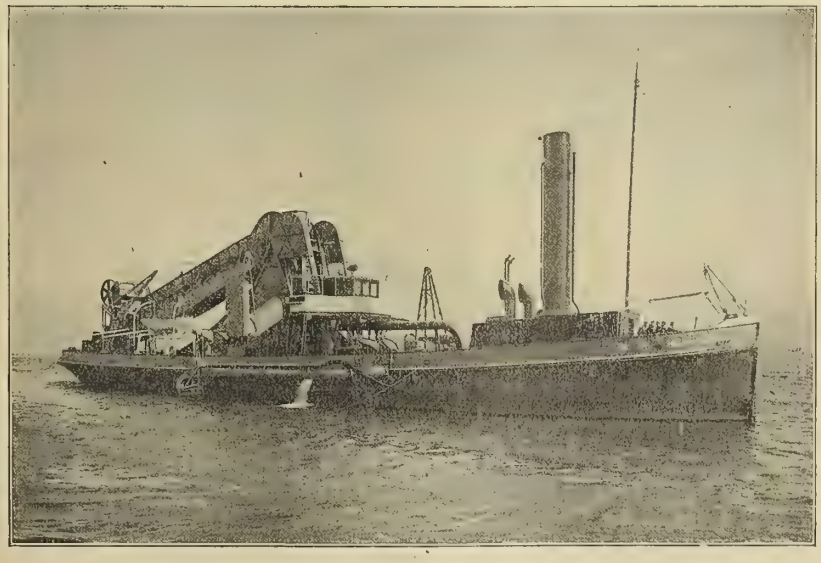

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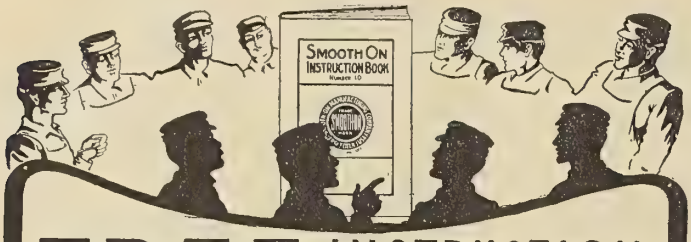

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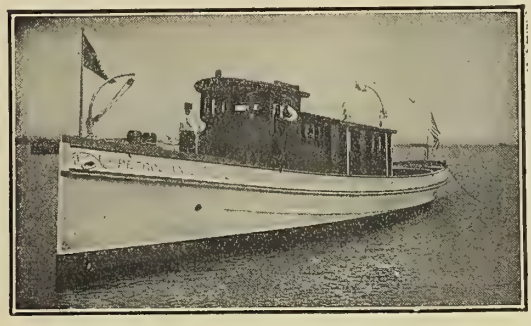

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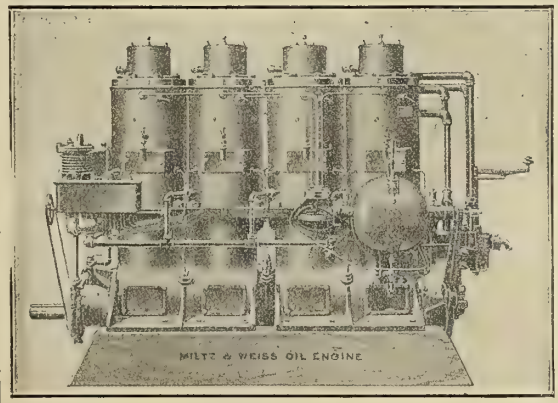

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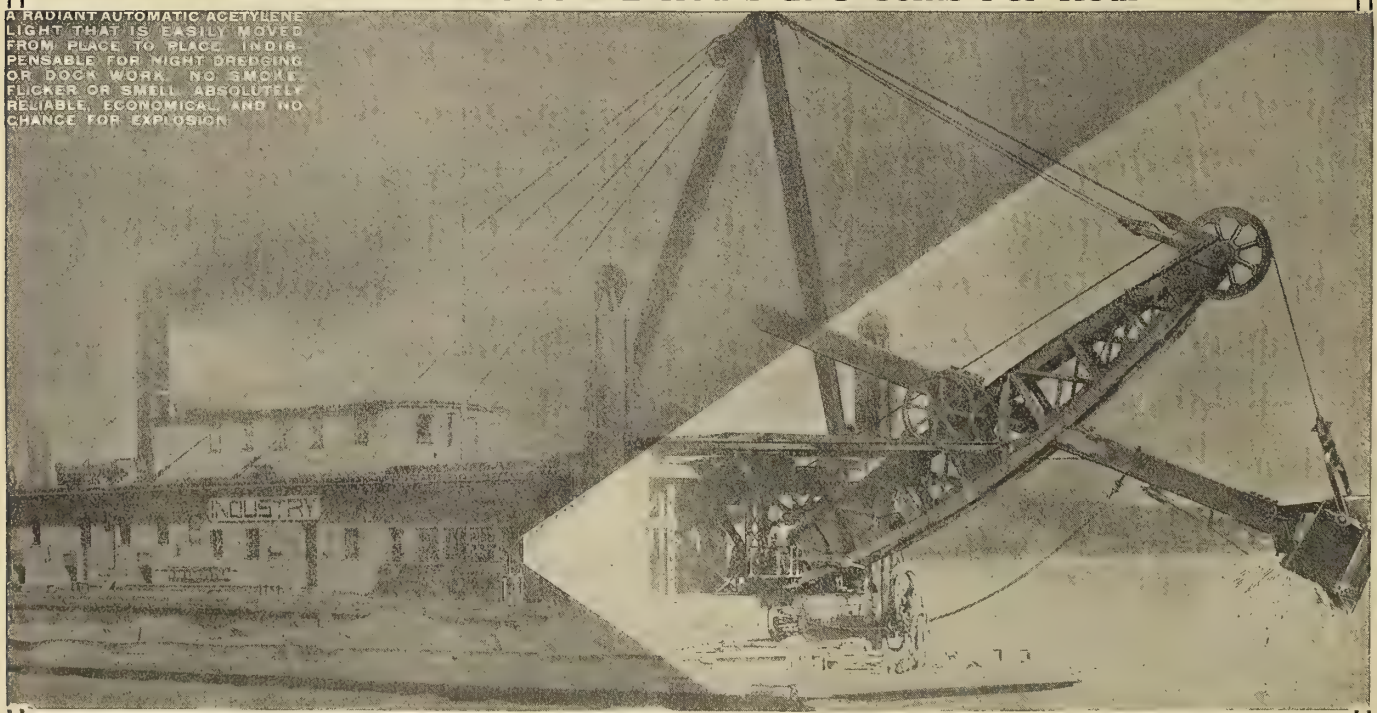
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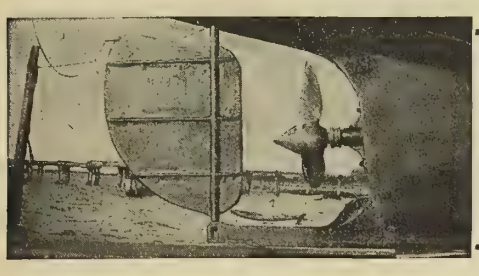

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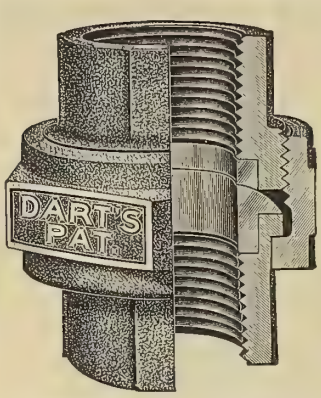

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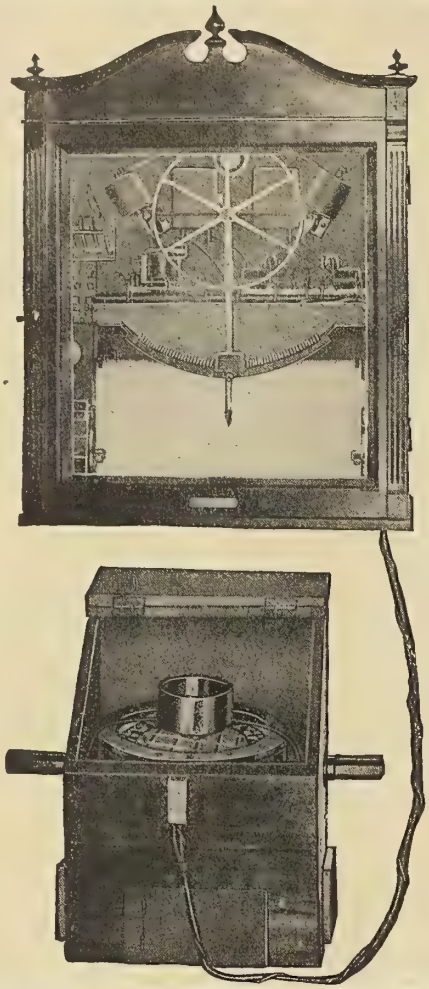

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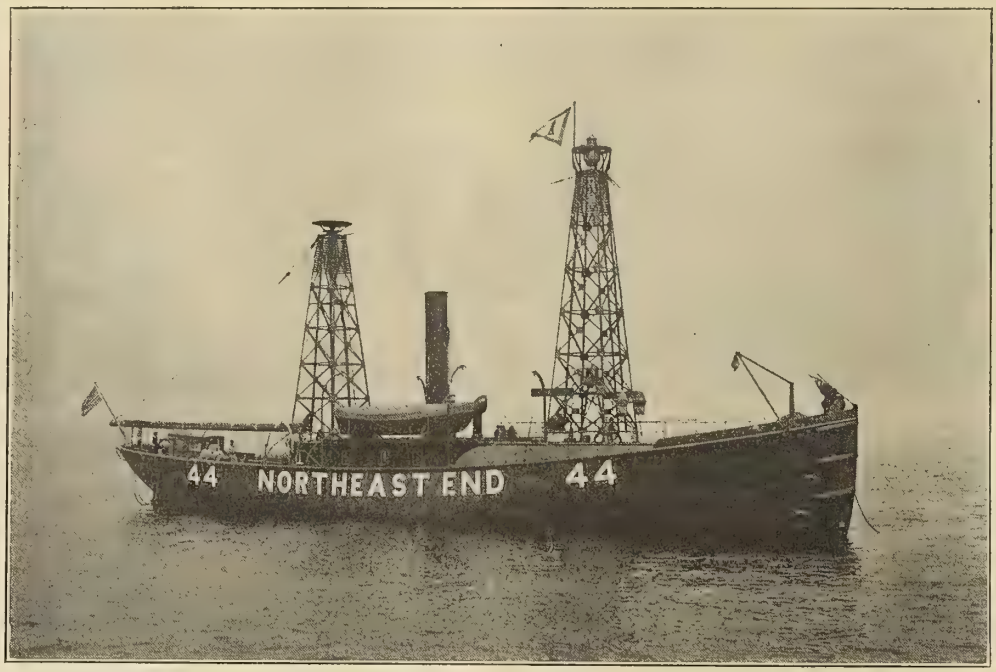

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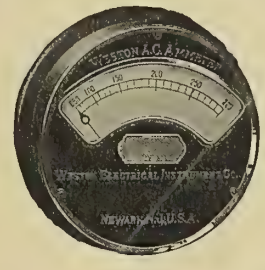

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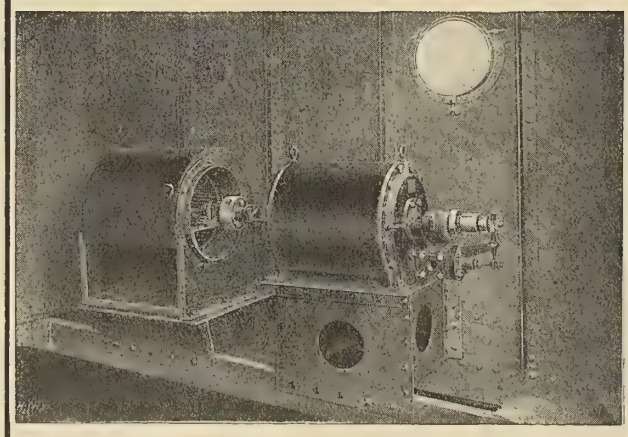

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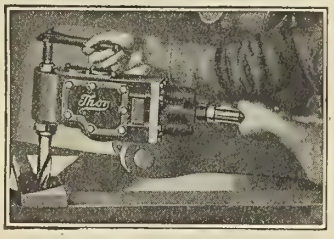

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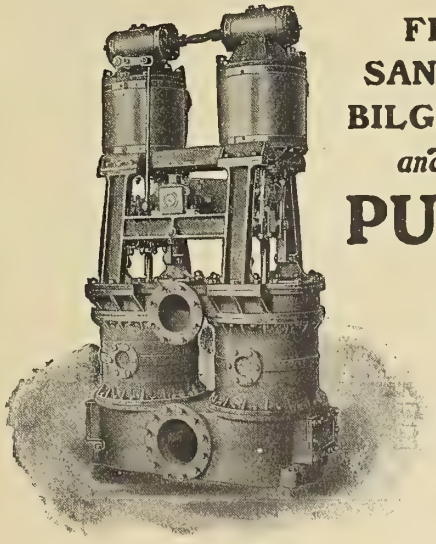

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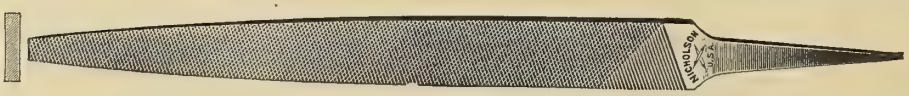

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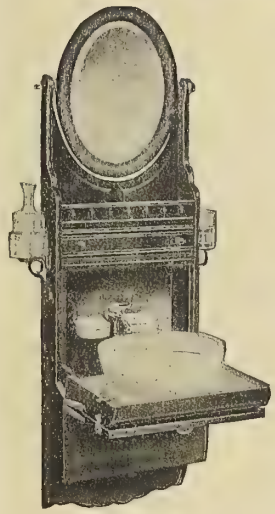

PLATE S-157

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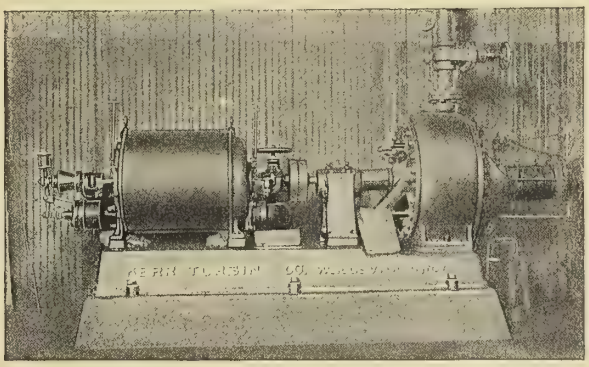

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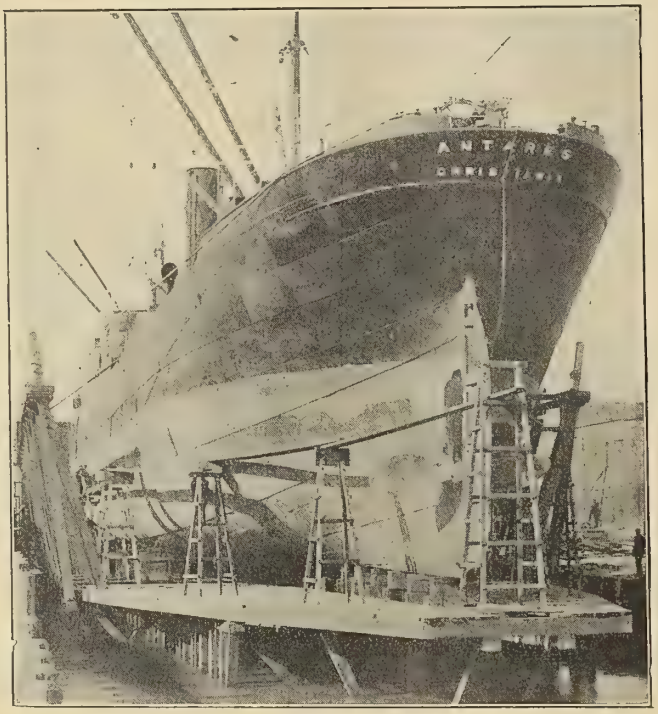

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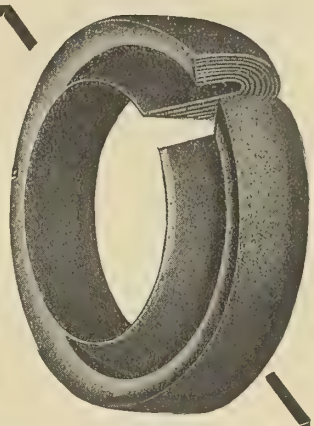

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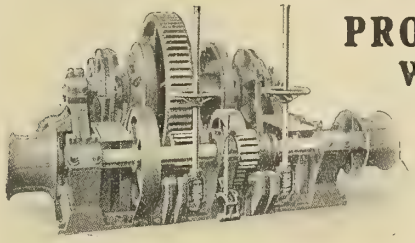

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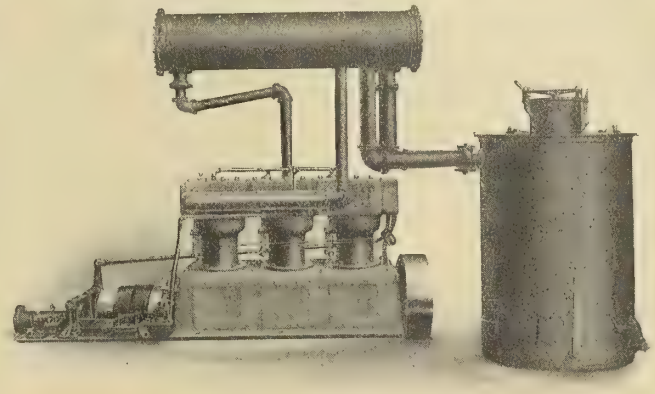

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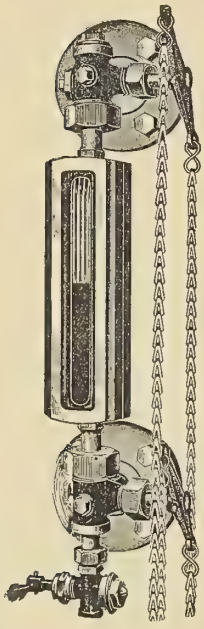

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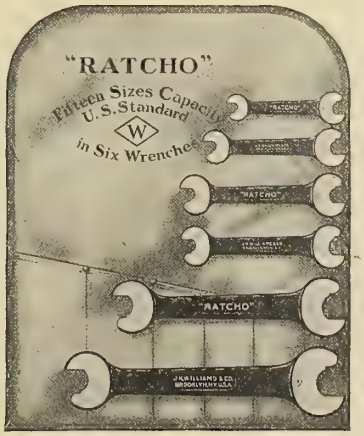

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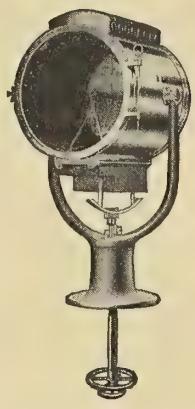

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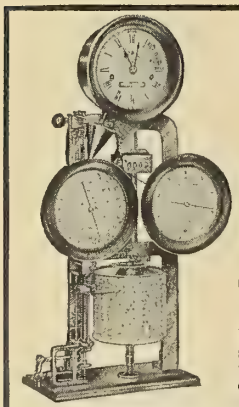

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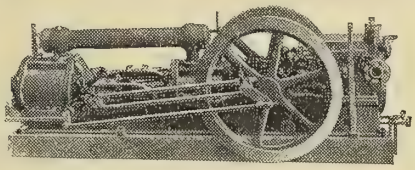
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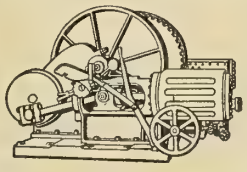
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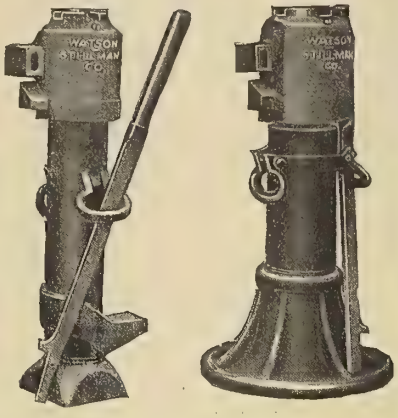

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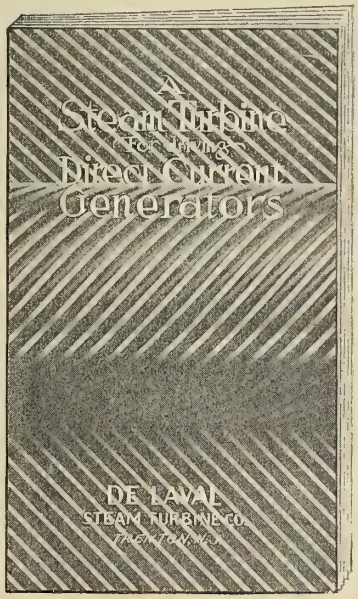

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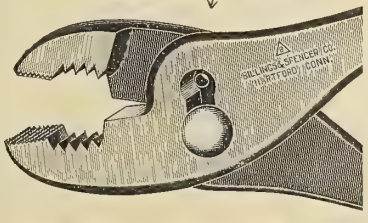

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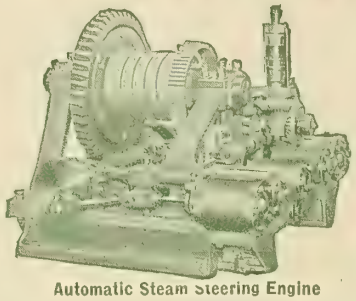

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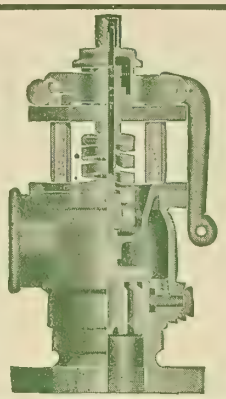

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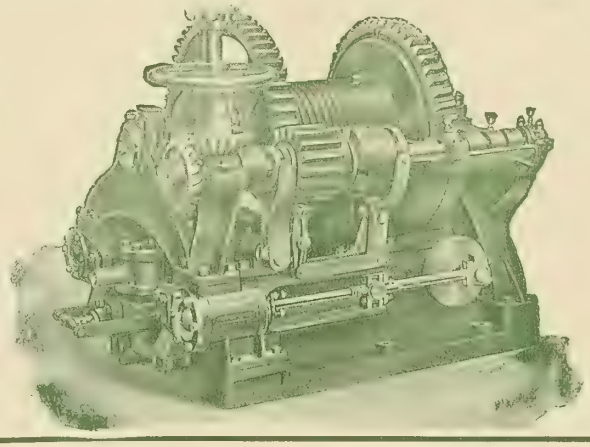

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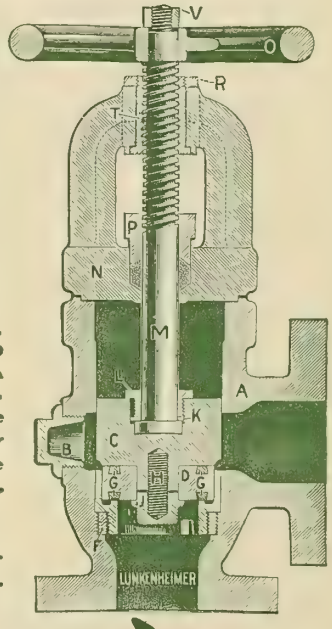

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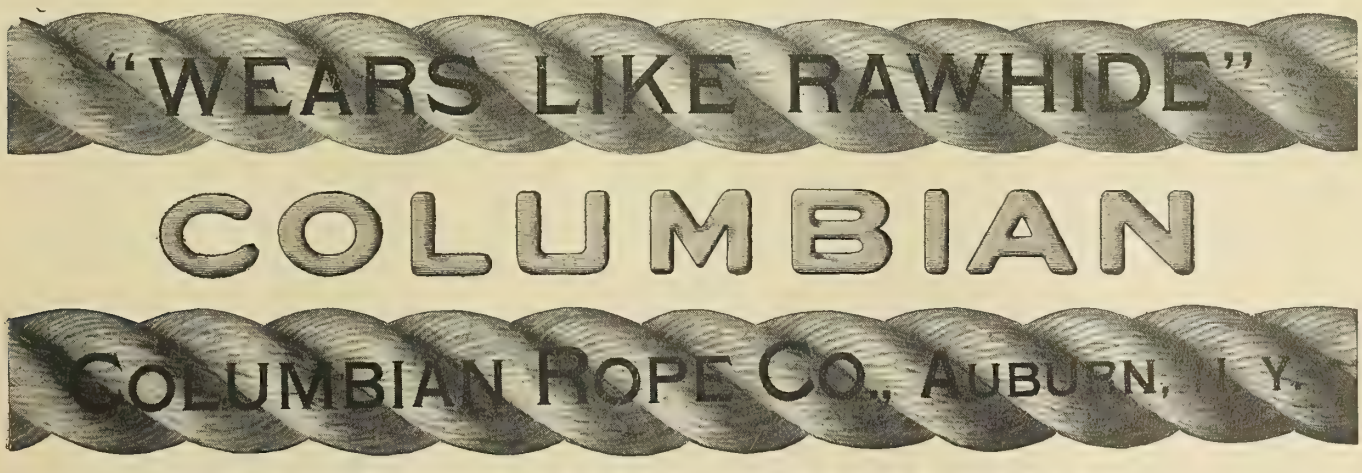

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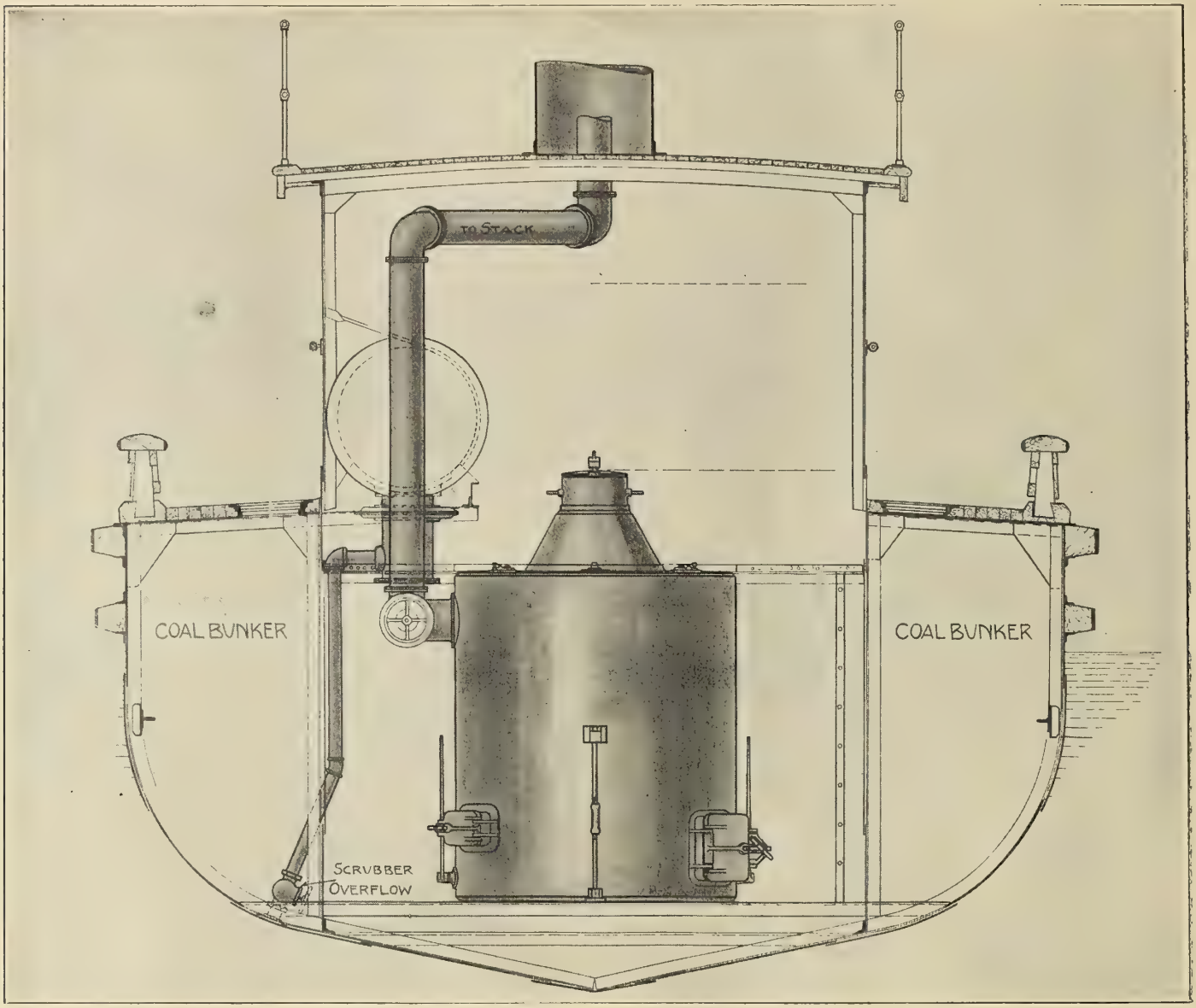

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FOR

MARINE COMMERCIAL SERVICE

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ECONOMY, RELIABILITY, SAFETY
COMPLETE PLANTS BUILT AND INSTALLED
FIFTY HORSEPOWER UPWARD

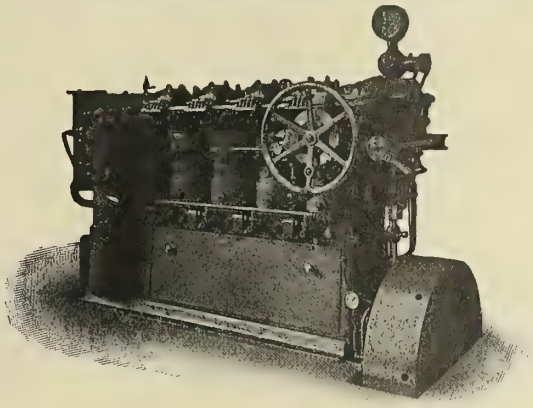
Gas Producer Plants furnished and installed in hulls now fitted with high grade gasolene engines

ADMIRALTY POWER CO.

PORT RICHMOND **NEW YORK**

SULZER DIESEL ENGINES

Most economical Internal Combustion Engines,
Burning cheap Liquid Fuel with high flash point.



Reversible Two Stroke Marine Engine

(Engine itself reversible)

SULZER BROS.

WINTERTHUR, Switzerland.

PRACTICAL MARINE ENGINEERING

FOR

MARINE ENGINEERS AND STUDENTS

WITH

Aids for Applicants for Marine Engineers' Licenses

By PROF. W. F. DURAND

SECOND EDITION, PRICE $5.00 (21/-)

THIS BOOK is devoted exclusively to the practical side of Marine Engineering and is especially intended for operative engineers and students of the subject generally, and particularly for those who are preparing for the examinations for Marine Engineers' licenses for any and all grades.

The work is divided into two main parts, of which the first treats of the subject of marine engineering proper, while the second consists of aids to the mathematical calculations which the marine engineer is commonly called on to make.

PART I.—Covers the practical side of the subject.

PART II.—Covers the general subject of calculations for marine engineers, and furnishes assistance in mathematics to those who may require such aid.

The book is illustrated with nearly **four hundred diagrams and cuts** made specially for the purpose, and showing constructively the most approved practice in the different branches of the subject. The text is in such plain, simple English that any man with an ordinary education can easily understand it.

FOR SALE BY

INTERNATIONAL MARINE ENGINEERING

17 Battery Place, New York, U. S. A.

Christopher Street
Finsbury Square, E. C., London

TRADE PUBLICATIONS.

AMERICA

Every engineer should send to Greene, Tweed & Company, 109 Duane street, New York, for a free working sample of "Palmeto" packing. It comes in twists in sizes ⅛ 3/16 and ¼ inch. Braided, round and square, from ¼ inch up. Catalogues free.

Boiler feeds and steam traps are the subject of folders issued by the Griscom-Spencer Company, 90 West street, New York. The "Morehead" return steam trap for working pressures up to 250 pounds is designed especially for the economical feeding of boilers from open or closed heaters and for returning condensation directly to the boilers from high-pressure, low-pressure or high and low-pressure heating lines, dry kilns, cooking kettles, etc., without the use of a pump or injector, the location of the return lines above or below the waterline of the boiler being immaterial.

The Jenkins automatic liquid discharger, operated by steam or compressed air, absolutely automatic. "Elevates from 2,000 to 4,000 gallons per hour of sewerage and liquid wastes from below the sewer or water level from 4 to 40 feet. Composition cylinder, special inlet and outlet valves. Especially adapted for yachts, ocean liners, steam vessels, buildings and any place where liquid is to be elevated from one level to another. Can furnish complete air compressor, tank and necessary fittings if desired, when same is to be used with air." Full particulars upon application to A. B. Sands & Son, 22 Vesey street, New York, who show a full line of sanitary fixtures in Catalogue "E," sent upon request.

Valves of many types, oil pumps, sight-feed oilers, injectors, and many other marine steam auxiliaries are described in illustrated circulars published by the William Powell Company, Cincinnati, Ohio. For this company's "Cyclone" blow-off valve the claim is made that its construction is so simple that it enables the engineer to adjust the valve at any time with an ordinary monkey wrench, a great convenience when it needs repacking. The disc and seat bearing are constructed with such a large angle that it is impossible for any sediment or scale to lodge between them, either while blowing off or closing the disc, so that they are not worn out after a few months of use. Every valve is tested to 250 pounds hydraulic pressure. The William Powell Company's improved screw-feed grease cup is especially designed for marine engines, and where it is desired to force the grease some distance, as in air compressors, ice machines, etc. It is said to be particularly desirable for intermittent or positive feed.

A complete line of metal-working machinery carried in stock by Joseph T. Ryerson & Son is described in catalogues issued by that firm. The statement is made that this machinery embodies "many special labor-saving tools that represent a distinct departure from ordinary methods and the latest development in each particular line. The constant study of metal-working processes by our engineering department, supplemented by an experience of nearly seventy years in the iron and steel business, affords us an unequaled opportunity to co-operate and assist prospective purchasers of equipment. We have furnished the complete equipment for many of the largest shops in this country, and are prepared to submit plans and estimates based on required output. Our service at all times comprehends a study of the desired production and the co-operation of our mechanical engineering staff. We carry in stock, for immediate shipment, a full line of machinery, permitting us to handle your at-once requirements as well as your future demands. We shall be pleased to have an opportunity to submit prices and estimates on your equipment needs."

"Smooth-On Protective Paints for Iron and Steel" is the title of the latest booklet published by the Smooth-On Manufacturing Company, Jersey City, N. J., and a free copy will be sent to any of our readers upon request. "In all parts of the world the Smooth-On iron cements have ably demonstrated that they are absolutely the finest preparations for making repairs on iron and steel. Wherever a boiler is to be repaired, a pipe joint made tight or a casting mended, Smooth-On cement suggests itself as the very first thing needed. It is, therefore, little wonder that we have received repeated requests for an iron paint that would be of the same high order as the Smooth-On iron cement—a paint that would be more than a mere covering, a paint that would permeate the pores of iron or steel and adhere tenaciously to their surfaces, making a positive and lasting protection to the metal. On this subject the chemist of the Smooth-On Company has been working for the past three years, and has produced what we think a perfect iron paint, one that we can safely label Smooth-On and know that it will live up to the Smooth-On reputation. This metal covering will be sold as Smooth-On iron paint."

Hydraulic punches, made in suitable sizes and types for any work from punching the small rivet holes in plate metal and standard sections to stamping out boiler manholes, are described in catalogues published by the Watson-Stillman Company, Church and Dey streets, New York. "If a portable punch is preferred, we furnish suitable wheel truck mounting. We also make presses, pumps, jacks, accumulators, benders and other tools for every purpose to which it is practical to apply hydraulic power."

"The Difference Between Albeco Laminated and Multi-Lap Leather Belting" is the title of a booklet distributed by the American Laminated Belting Company, 113 Hudson street, New York. This booklet is especially interesting in that it gives close comparisons of the operating principles, power transmitting qualities and ultimate economy of both types of belting. That laminated belting can handle heavy loads is forcibly shown in this booklet by the description of the main drive in the Cocheco Department, Pacific Mills, Dover, N. H., where 84 inches width of laminated belt on one pulley are transmitting 1,544 horsepower. These belts, consisting of two 30-inch and one 24-inch belt, all ⅝ inches thick, are said to comprise the largest installation of laminated belting on one drive in the world, and were installed by Lockwood, Greene & Company, the Boston mill engineers, because no lapped belts would transmit the power under the severe conditions imposed.

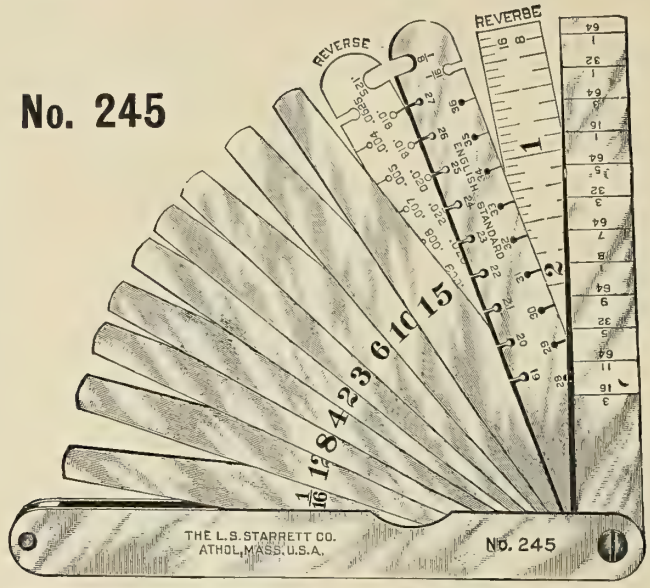
Reducing valves are described in Bulletin No. 120, published by Elliott Company, 6907 Susquehanna street, Pittsburg, Pa. "Where it is desirable to use liquids, gas, air and steam at a pressure lower than the initial pressure, reducing valves or pressure regulators are employed. Like all other successful mechanical devices, a reducing valve, to give perfect satisfaction, must be simple in design, have few wearing parts, all of which should be accessible for repair and adjustment. Up to the present time, all the reducing valves on the market involve the use of some kind of a diaphragm in their operation, and in some types several diaphragms are used in combination with inside springs, or a system of complicated levers, which require the services of a skilled mechanic to take apart and reassemble. In the diaphragm type of reducing valve the range of valve opening is proportional to the size of the diaphragm, its life depending upon the range of valve movement. Consequently the use of a diaphragm in large valves is a very dangerous practice, and one to be avoided to secure the best results."

Elastic metal gaskets are described in circulars published by the U. S. Indestructible Gasket Company, 50 Church street, New York. "This metallic gasket may be used in place of rubber or other destructible materials in general use for packing. It often consists of sheet metal, stamped with concentric corrugations. Six to eight corrugations are all that are necessary, so that the space within the bolt holes usually determines the width of the gasket. In cases where the flanges are thin, and for this reason liable to bend when the bolts are tightened, it is advisable to extend the copper gasket to the full width of flange. This will, of course, require the cutting of bolt holes in the gasket. Connections made with these gaskets will not blow out after continued use, for each corrugation makes the entire circle of the flange, and so long as the contact is kept complete by compression the joint cannot leak. These gaskets never blow out like rubber or asbestos. They may be put in place while steam is leaking. Answer well on pipes in which steam is alternately on and off, for it is not impaired by the repeated expansion and contraction."

Consolidated pop safety valves are described in a handsome cloth-bound volume of 78 pages, published by the Consolidated Safety Valve Company, 85 Liberty street, New York City. "The Consolidated Safety Valve Company has within the last two years inaugurated two exceedingly important movements in the safety-valve practice of this country—movements which are causing universal modifications of design, and, for the first time in the history of engineering, are putting the methods of safety-valve rating and specifications upon a sound basis. This has, of course, required exhaustive testing and research, in conducting which this company has spared no expense, deliberately adopting the policy of giving the results freely to the engineering public. This policy has obtained for the company in this work the co-operation of railroads, of stationary and marine interest, and of eminent engineers, adding much to the broad application and value of the results obtained. The movements referred to are: First, for the rating and specifying of safety valves according to their actual relieving capacities; and, second, for increasing their efficiency by modifications in design, which make possible the obtaining of larger capacities and a cleaner, more positive action."

Engineers' Taper, Wire & Thickness Gage

No. 245



This gage is especially designed for the use of marine engineers, machinists and others desiring a set of gages in compact form.

The taper gage shows the thickness in 64ths to 3-16ths of an inch on one side, and on the reverse side is graduated as a rule three inches of its length, reading in 8ths and 16ths of an inch.

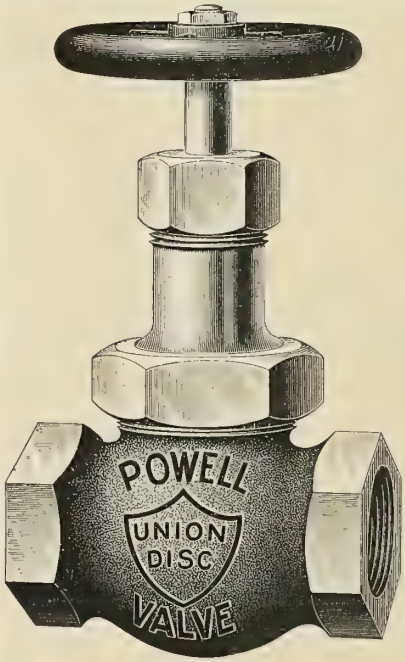
The wire gage, English Standard, shows on one side sizes numbered from 19 to 36, with two extra slots, one 1-16, the other ⅛ of an inch, and on the reverse side shows the decimal equivalents expressed in thousandths. This gage has also 9 thickness or feeler gage leaves, approximately 4 inches long, of the following thicknesses: .002, .003, .004, .006, .008, .010, .012, .015 and 1-16th of an inch, all folded within the case, which is 4¾ inches long, convenient to handle or to carry in the pocket.

Price, each, $3.50 **Catalogue 18-L Free.**

THE L. S. STARRETT CO., Athol, Mass., U.S.A.

London Warehouse, 36 and 37 Upper Thames St., E. C.

If you are a dealer and stock Iron and Brass Steam Engineering Fittings you want to know about the Powell line. Here is a specialty.



The POWELL UNION DISC VALVE

Made on the same lines as the Powell WHITE STAR Valve but with a composition fibre disc.

Notice the ground joint connection between bonnet and body secured by the hexagonal union nut. Notice that the threads that take the union nut are outside the neck. You don't need red lead or other cementing to make them tight.

There is a demand for valves of this class which is growing every day. Write for our catalog and ask for our dealer's proposition—the cost is a postage stamp for your letter and you cannot lose.

THE WM. POWELL CO.

DEPENDABLE ENGINEERING SPECIALTIES.

CINCINNATI

Lubrication Troubles?

You can cure many or all of these with Dixon's Flake Graphite. Unlike oil, Dixon's Graphite will do no injury to boilers if it reaches them. Sample 75-C Free.

JOSEPH DIXON CRUCIBLE CO.
JERSEY CITY, N. J.

The Sprague electric hoist, made by the Sprague Electric Company, 527 West Thirty-fourth street, New York, is a labor-saving device, and is designed for the same purpose as the automatic machine tool—to cheapen and increase production. Generally speaking, it is used to handle loads which, on account of their location, are inaccessible to the ordinary traveling crane, or which are too small to be economically handled by such a large and expensive machine. The claim is made that the Sprague electric hoist is made in a greater variety of sizes and designs than any other similar appliance.

THE BOUND VOLUME

OF

International Marine Engineering

FOR

January-December, 1910, is now ready for delivery

PRICE, $4.00 (16/-)

Buyer Pays Express Charges

NEW YORK
Whitehall Building, 17 Battery Place

LONDON
31 Christopher Street, Finsbury Square, E. C.

Recording instruments for pressure, temperature and electricity are the subject of an illustrated pamphlet of 64 pages published by the Bristol Company, Waterbury, Conn. This pamphlet states that one of the most important features of Bristol instruments has always been their extreme simplicity of construction and operation, and that the general principle on which they have been designed is that the most simple equipment that will do the work is the most practical equipment for that work, because it is the easiest to maintain.

"Oakite," for use on board ship, is described in a pamphlet published by the Oakley Chemical Company, 114 Liberty street, New York. "Oakite recovers all the oil absorbed by wiping waste—unchanged chemically or physically—ready for re-use. Oakite emulsifies, not saponifies, as do alkalis. The waste (or wiping cloths) cleaned at same time may be re-cleaned indefinitely. One factory sent us clothes cleaned over 90 times. A railroad, waste cleaned 67 times—a better absorbent than new. Oakite does not injure the fiber. Ask for circular No. 67. Oil and waste saved for re-use at a cost of 15 percent. Often 10 percent or less. You can make the apparatus. Figure what this saving means to you in oil, grease, waste-wiping cloths, etc. Circular No. 67 gives other uses of Oakite—cleaning machinery, belting, tools, floors, walls, etc., cheaper, easier, quicker, better. No soapy smell; no greasy, soapy film; no cutting acids or alkalis."

TRADE PUBLICATIONS

GREAT BRITAIN

The Phosphor Bronze Company, Ltd., 87 Sumner street, London, S. E., have just issued a catalogue giving descriptions of their various well-known specialties, which comprise phosphor bronze—cast, rolled and drawn; gunmetal—ingots and castings; brass—ingots and castings; white anti-friction metals, printing metals, and all non-ferrous alloys. The compositions, uses and tests are given. The catalogue is well got up and illustrated, and will be useful to all who use phosphor bronze.

Vice-Admiral H. L. Fleet has a keen observation and a ready pen. He has turned both to excellent effect in a collection of stories and poems, which has just been issued in his name by Swan, Sonnenschein & Company, 25 High street, Bloomsbury, London, at 5/-. Besides being thoroughly entertaining the pages constitute an excellent picture of life in the navy. Some of the yarns and poems have already appeared in the pages of the *Naval and Military Record,* and they were certainly worthy of the permanency which has now been given them.

A volume of stirring essays on thirteen fighting sailormen has been published by Smith, Elder & Company, of Waterloo Place, London, S. W., under the title of *Fighting Admirals.* Mr. John Barnett, the author, writes in a spirited style, and the charm of his book is enhanced by the addition of some ten authentic portraits, and a very excellent picture, *"A Straggler from a Forgotten Fight,"* by H. W. Stagg, constitutes the frontispiece. This latter shows a dismantled old three-decker, concerning which a short sketch is included. The vessel is the old *Impregnable,* used in the bombardment of Algiers by Lord Exmouth. The studies cover a period from the time of Edward III. to Lord Cochrane. It is hardly wise to select any of the sketches, as each has been dealt with so ably, but we are particularly attracted by the studies on Prince Rupert, Sir Walter Raleigh, three of Rodney's fights and Benbow and his last fight.

A catalogue of steam-proof flare lights, hand-lamps, etc., is published by Imperial Light, Ltd., 123 Victoria street, London, S. W. "The introduction of Imperial lights has revolutionized the lighting of open spaces. These lights are more handy, efficient and economical than any other form of flare, and no one who is dependent from time to time upon portable lights can possibly afford to be without them. We are now supplying Imperial lights to every country in the world. They have been subject to the severest tests under every conceivable condition, and the general opinion of our thousands of customers is that Imperial lights are without exception the very best for the purposes for which they are designed. During the last few years the sales of Imperial lights have increased beyond our most sanguine anticipations, and our success is entirely due to the simplicity and efficiency of design, coupled with the economy in initial cost and maintenance. Imperial acetylene flare lights and hand-lamps, which are fully protected by British and foreign patents, are dealt with in detail in this catalogue, and the illustrations are from photographs of actual lights of each type."

The India-Rubber, Guttapercha & Telegraph Works Company, Ltd., of 100-106 Cannon street, E. C., recently isued a very handsome catalogue, giving full details of their rubber tiling. This form of flooring is especially suitable for use on board ship; it is noiseless, durable, sanitary and waterproof, and is also pleasant to walk upon. The tiles, which are fixed by a special cement, are made in different shapes and colors, so that a very large variety of designs can be carried out. The catalogue contains several colored engravings, showing interiors of ships with this form of flooring in use.

Light-framed compound engines for steam yachts, launches, etc., are described in circulars published by W. Sisson & Company, Ltd., Gloucester. "The engines are suited for working pressures up to 250 pounds if required, the cylinders being correctly proportioned to suit. They are provided when required with suitable boiler, stern gear, cocks, valves, pipes and all accessories, forming a complete set of machinery all ready for fixing on board. We also undertake to do this work, or in case of machinery for export to carry out steam test in our works, afterwards dismantle, pack and protect securely for shipment, and supply complete erection drawings and all necessary information."

BUSINESS NOTES

AMERICA

THE NATIONAL BOAT & ENGINE COMPANY, incorporated in Maine, has been formed to combine a number of prominent power boat and engine manufacturing companies. A partial list of the companies absorbed is as follows: Racine Boat Manufacturing Company, Muskegon, Mich.; Truscott Boat Manufacturing Company, St. Joseph, Mich.; Pope Boat Company, Fond du Lac, Wis.; Pierce Motor Boat Company, Racine, Wis.; Shell Lake Boat Company, Shell Lake, Wis.; Western Boat & Engine Works, Michigan City, Ind.; West Mystic Manufacturing Company, West Mystic, Conn.; Inland Lakes Boat Company, Lake Geneva, Wis. The president of the new company is Walter J. Reynolds; vice-president, J. M. Truscott; secretary, John Q. Ross.

RECORD CONCRETE LAYING AT GATUN LOCKS.—All hourly records for concrete laying were broken on Oct. 6 by the cableways used in constructing the great locks on the Panama Canal at Gatun. Two million cubic yards of concrete are to be used in building these locks. Lidgerwood cableways, made by the Lidgerwood Manufacturing Company, 96 Liberty street, New York, are used for placing the concrete. These cableways are arranged in duplex form on four pairs of towers. The pair of cableways which broke the record are known officially as "Strand A" and "Strand B," of cableway No. 1. Strand A placed 49 cubic yards in one hour, and Strand B placed 50 cubic yards during the same hour. This means that the carriage on each strand made 25 trips per hour. The cable ways were sold under a guarantee that they would make 20 trips per hour. These cableways are arranged to give higher carriage speed than was ever attempted before for this class of work. This speed is rendered possible by important improvements made by Mr. Spencer Miller in anticipation of just such needs. With these improvements it is possible to use carriage speeds up to 2,500 feet per minute, as against speeds of 800 or 900 feet per minute, which were as great as were before practicable. The cableways each have a span of 800 feet between towers. They are actuated by electricity, and the control is as easy and simple and of the same character as the control of an up-to-date electric train. One operator controls the entire operation on each strand.

KEENAN'S PATENT NON-CONDUCTING COMPOSITION

THE BEST AND MOST ECONOMICAL COVERING IN EXISTENCE.

WILL OUTLAST ANY OTHER MAKE & GIVE BETTER RESULTS.

Does not Pit the Metal or Crumble Away.

MATTHEW KEENAN & CO. LTD.

Makers of all kinds of Coverings,

TREDEGAR ROAD, BOW, LONDON, E.

— AND —

80, GREAT WELLINGTON ST., GLASGOW.

Pacific Steam Navigation Co.'s SS. "Orcoma."
Boilers, Cylinders and all Pipes covered by Matthew Keenan & Co., Ltd.

WILLIAM C. HENNING has resigned as president and treasurer of the Durable Wire Rope Company, Boston, Mass., and has accepted the position of secretary and treasurer of the A. Leschen & Sons Rope Company, of St. Louis, Mo.

THE DE LAVAL STEAM TURBINE COMPANY, Trenton, N. J., announces that the Dravo-Doyle Company, by whom it has heretofore been represented in Pittsburg, Philadelphia and Cleveland, will open an office in Chicago at the Marquette building, in charge of Mr. H. S. Budd. The Dravo-Doyle Company has been very successful in the introduction of De Laval steam turbines for high and low steam pressure, and for direct connection to electrical generators, centrifugal pumps, blowers, etc., and has a wide experience in the general engineering and installation work connected with this kind of machinery, also with De Laval centrifugal pumps, all classes of service, including boiler feeding, hydraulic pressure service, water works, etc., as described in a 90-page book on this subject recently published by the De Laval Steam Turbine Company. Mr. Budd is well qualified and prepared to advise with prospective purchasers on all questions relating to steam turbines, centrifugal pumps and other centrifugal machinery.

J. & E. HALL Ltd.

10, St. Swithin's Lane, London, E.C., and Dartford Ironworks, Kent, England,

MAKERS OF CARBONIC ANHYDRIDE (CO_2)

REFRIGERATING MACHINERY

REPEAT INSTALLATIONS SUPPLIED TO

BRITISH ADMIRALTY	132	JAPANESE ADMIRALTY	46	ITALIAN ADMIRALTY	21
HAMBURG AMERICAN LINE	63	P. & O. STEAM NAV. Co.	36	TYSER LINE	16
UNION CASTLE MAIL S. S. Co.	57	WHITE STAR LINE	33	HOULDER LINE, Ltd.	13
ELDER DEMPSTER & Co.	53	CHARGEURS REUNIS	26	ELDERS & FYFFES, Ltd.	13
ROYAL MAIL S. P. Co.	48	NIPPON YUSEN KAISHA	22	CANADIAN PACIFIC Ry.	12

OWING TO GREATLY INCREASED BUSINESS the H. W. Johns-Manville Company announces the removal of its offices, now located at 85 Sheldon street, Houghton, Mich., to more commodious and convenient quarters at 96 Sheldon street, where they will be better prepared to serve their patrons. As in the past, Mr. S. T. Harris, who has been associated with the company for a number of years, will be in charge of the offices at the new address.

MR. WALTER BRINTON, superintendent of the manganese steel department of the Taylor Iron & Steel Company's plant at High Bridge, N. J., since 1895, has resigned, and has accepted a position as consulting engineer for the Edgar Allen American Manganese Steel Company, which is manufacturing manganese steel at Chicago Heights, Ill., and at New Castle, Del. Mr. Brinton's headquarters will be at the New Castle plant.

W. IRVING ADAMS & SON, ship and yacht builders, East Boothay, Me., announce that they have incorporated, under the laws of the State of Maine, as the Adams Shipbuilding Company, Inc., and have made arrangements to handle an even larger business than previously. They now have associated with them William J. Deed, Jr., naval architect, of Boston, who will handle the architectural end of the business. They also have the Maine agency for Blount & Lovell motors, made in Boston. As in the past the business will be kept to a high standard, and the firm, well known for years along the entire coast, would be pleased to submit plans and estimates upon receipt of your requirements. The Boston office is at 113 Devonshire street, room 68.

TWO 120-HORSEPOWER DIESEL OIL ENGINES are to be installed on each of the Argentine warships now building in the United States. These engines are to be directly connected to electric generators to serve as port lighting sets, so that electric light service and energy can be furnished on the battleships at a minimum cost when in port by avoiding the expense of operating the boilers. We understand that this method has been adopted by the British Admiralty with marked success. The contracts for this work have been made by the American Diesel Engine Company, St. Louis, Mo., with the Fore River Shipbuilding Company and the New York Shipbuilding Company, who are building the two Argentine battleships.

A CORRECTION.—In our December issue the statement was made that "more than 100 horsepower of engines made by A. Mietz, 130 Mott street, New York City, are now in operation." This was, of course, a mistake, and should have read: "More than 100,000 horsepower." These engines use kerosene, fuel oil, crude oil and alcohol.

ANNOUNCEMENT IS MADE that the business of William Forgie, Washington, Pa., has passed into the hands of the Duff Manufacturing Company of Pittsburg. The latter concern has bought the entire Forgie plant, including its business and all rights and privileges of making the oil-well jacks originated in the early days of the business by William Forgie.

THE BARNEY & SMITH CAR COMPANY, Dayton, Ohio, has just placed an order with Tate, Jones & Co., Inc., Pittsburg, Pa., for two portable oil rivet forges, which makes a total of nine of this type of forge which they have purchased from Tate, Jones & Company, Inc.

THE VANADIUM STEEL PISTON RODS, made by the American Vanadium Company, 318 Frick building, Pittsburg, Pa., are stated to possess the following physical properties: Elastic limit, 101,000 pounds; tensile strength, 125,000 pounds; elongation in 2 inches, 20 percent; reduction of area, 55 percent.

THE PAWLING & HARNISCHFEGER COMPANY, Milwaukee, Wis., announces that owing to the great increase in its business on the Pacific Coast, it has opened a branch office in the Washington building, Portland, Ore., in charge of Mr. R. K. Morse, who for some years past has been a member of tis engineering staff at the home office in Milwaukee.

THE WILLIAM H. WOOD LOCOMOTIVE FIRE-BOX & TUBE PLATE COMPANY, Media, Pa., states that its fire-boxes and tube plates are the only formation by which expansion and contraction is neutralized. Complete fire-boxes and tube plates may be seen and examined at the Baldwin Locomotive Works, Philadelphia, Pa.

HIGH-GRADE BRONZE AND BRASS CASTINGS, phosphor bronze, government gunmetal, boring bronzes and red and yellow brass are the product of the American Manganese Bronze Company, 99 John street, New York. This company publishes some tests of "Spare's manganese bronze made at various dates from separate heats, and has at its works a 100,000-pound Tinius Olsen testing machine, with which it states that every batch of metal sent out is carefully tested.

COBBS HIGH PRESSURE SPIRAL PISTON

And VALVE STEM PACKING

IT HAS STOOD THE TEST OF YEARS AND NOT FOUND WANTING

IT IS THE MOST ECONOMICAL AND GREATEST LABOR SAVER

WHY? Because it is the only one constructed on correct principles. The rubber core is made of a special oil and heat resisting compound covered with duck, the outer covering being fine asbestos. It will not score the rod or blow out under the highest pressure.

NEW YORK BELTING AND PACKING CO.

91 and 93 Chambers Street, NEW YORK

LONDON, E. C., ENGLAND, 11 Southampton Row

CHICAGO, ILL., 150 LAKE STREET
ST. LOUIS, MO., 218-220 CHESTNUT STREET
PHILADELPHIA, PA., 118-120 NORTH 8TH STREET
SAN FRANCISCO, CAL., 129-131 FIRST ST. OAKLAND
BOSTON, MASS., 232 SUMMER STREET
PITTSBURGH, PA., 913-915 LIBERTY AVENUE
PORTLAND, ORE., 40 FIRST STREET
SPOKANE, WASH., 163 S. LINCOLN STREET

BUSINESS NOTES

GREAT BRITAIN

THE NEW GRAVING DOCK which the Admiralty are providing at Portsmouth is being constructed alongside the lock. Both these undertakings are being built in basin No. 3. Entrance to the new dock will be obtained through basin No. 4 (which is approached from Fountain Lake), by demolishing the Naval Depot Parade, but it is proposed eventually to construct an entrance at the other end of the dock, giving access direct from Fountain Lake, thus making it identical with the lock. This proposal, however, is for the present in abeyance. On the completion of the new dock, to be accomplished by August, 1913, the remaining portion of the basin No. 3 will have accommodation for two battleships. Under the contract, which has been placed with Messrs. Morrison & Mason, of Glasgow, the walls of the dock, to be built of mass concrete, will be 26 feet thick at the base and 11 feet thick at the coping, while the depth of concrete on the bottom will be 19 feet. Granolithic facings will be provided on the bottom and also on the sides up to 20 feet 6 inches from the coping. From that point the walls will be faced with blue brickwork. There will be seven altars. The length of the dock will be 918 feet from center of caisson to the temporary end wall, the depth will be 55 feet 8 inches, with 1 foot rise in the course of the length, and the width will be 119 feet between the copings. The entrance, which will be opened and closed by a floating caisson, will be 110 feet in width and 45 feet 2 inches deep on the sill, or 40 feet deep at high water. The outer entrance, when constructed, will be furnished with a sliding caisson, and then the length of the dock will be 876 feet 6 inches from center to center of caissons. A maximum length of 938 feet 3 inches center to center will be obtainable by placing the caissons in the outer stops to be provided for the purpose. The dock will be emptied through a special culvert by means of the pumping plant provided for the lock, as it is unlikely that it will be necessary to empty them simultaneously. A subway, measuring 6 feet 6 inches by 4 feet 6 inches, for the accommodation of pipes, cables, etc., will be constructed under the coping all round the dock. The wharves will be 170 feet wide, and a 50-ton crane will be erected on the new wharf on the south side of the basin.

THE SEAMLESS STEEL BOAT COMPANY, LTD., Wakefield, writes INTERNATIONAL MARINE ENGINEERING that it makes boats of all sizes for shallow draft work, and not merely 40-foot boats, as might be inferred from the article in our November issue describing this company's product.

IT IS WELL KNOWN, says the London *Times*, that those firms who have already equipped and made use of experimental tanks for testing ship models attribute their success in out-of-the-way undertakings involving questions of speed, draft, consumption, etc., to the possession of such tanks and the special data they afford. The value of such tanks is being more and more appreciated since increased attention began to be paid to propellers as factors in speed results, especially as associated with steam turbine propulsion. It has been remarked that solely on account of the saving possible in trial-trip expenses with the finished vessel many firms may soon realize the advisability of laying down experimental plants. In the case of new designs especially, the ultimate expenses of trial after trial may often much exceed the annual cost of the scientific investigations by means of tank experiments. As a matter of fact several firms have tanks of some kind in which models are regularly tried, although not with all the nicety and elaborateness possible in a tank of the Froude type. For comparative purposes, the results, it is felt, need not have all the academic minuteness and finish of those obtained in establishments carried on under the ægis of government departments or university chairs. Messrs. Alex. Stephen & Sons, on the Clyde, for example, have made it a practice for years, when the conditions of design were unusual, to try models, variously modified, in a tank of moderate length in their works. Mr. Fred. J. Stephen has conducted these experiments, using apparatus of his own devising, in which a falling weight for towage, with due corrections for gravity and velocity, has been a feature, and to the data obtained by these means over long periods he attributes the firm's success with many of their vessels. But for the aid afforded in this way the firm would repeatedly have declined to accept contracts which they have, in the event, successfully carried out. At the present time the firm are laying down a new and much improved tank, which will be fitted with the necessary towing and recording apparatus, devised with every regard to accuracy and uniformity in results.

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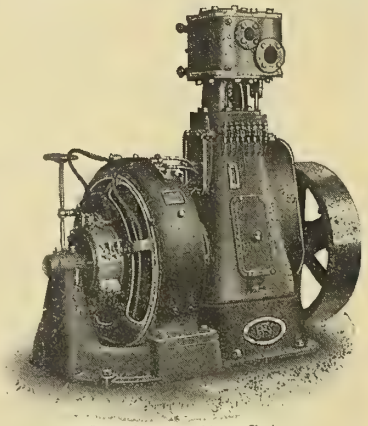

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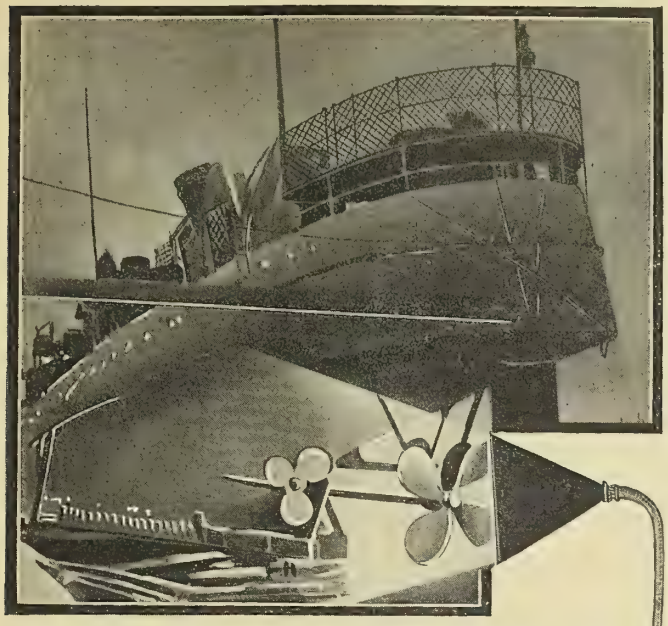

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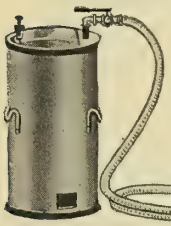

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THE BRITISH MANESMANN TUBE COMPANY, LTD., Salisbury House, London, E. C., states that its weldless steel spigot and faucet tubes and weldless steel hydraulic tubes are used at the new Leith docks as well as the new docks at Immingham, Methil and Hull.

THIS BEING THE JUBILEE YEAR of the Greenock Philosophical Society, under whose auspices for many years the celebration of the anniversary of Greenock's most eminent native, James Watt, has been held, a specially attractive syllabus has been arranged to mark the event. In addition to the usual programme of lectures, it has been decided to celebrate the fiftieth anniversary some time in January, when the Watt anniversary lecture falls to be delivered. The lecturer on this occasion is Prof. J. H. Biles, of the chair of naval architecture, Glasgow University. The James Watt dinner, held annually under the auspices of the Scottish Institution of Engineers and Shipbuilders, will on this occasion take place in the St. Andrew's Halls, the accommodation in the largest of Glasgow's restaurants having on the past two or three occasions proved somewhat inadequate to the demands.

THE CONTRACT for the dock gates and machinery for the new graving dock being constructed by the Leith Dock Commissioners was secured by Sir W. G. Armstrong, Whitworth & Company, the price being £7,650. The pumping machinery for the new dock is being supplied by Messrs. W. H. Allen, Son & Company for £4,934. A new warehouse at the Imperial Dock, adjacent to the graving dock, is being constructed by Messrs. Redpath, Brown & Company, at a cost of £3,050.

MESSRS. SMITHS' DOCK COMPANY, LTD., of North and South Shields, having now established new graving docks and a shipbuilding yard at South Bank-on-Tees, are preparing the site hitherto occupied by their shipbuilding yard at North Shields for docking purposes. Messrs. John Aird & Company, of Westminster, are constructing a new drydock 525 feet in length, 71 feet clear width of entrance, and with a depth on sill of 22 feet h. w. o. s. t. The dock gates will be of steel, one being about 60 feet and the other 30 feet long. The walls will be of concrete. The whole of the machinery will be electrically operated, the current being taken from the mains of the Newcastle-upon-Tyne Electric Supply Company. This new dock will be one of the group known as the "Bull Ring" docks, which will then consist of three large docks, and will be employed more especially in the docking and repairing of oil steamers.

THE MASCHINENFABRIK AUGSBURG-NÜRNBERG, who were the original constructors of the Diesel oil engine, the first machine of 20 horsepower having been put to work in 1897, after four years of experiment by Dr. Diesel, have recently carried out at Nüremburg a good deal of experimental work with the object of constructing a satisfactory horizontal Diesel engine, and a type has now been developed which can be made up to 400 horsepower, and probably more. The advantages claimed for a horizontal engine over the vertical one are greater accessibility of all working parts, much reduced headroom, more regular cooling of the cylinders, and greater ease of dismantling. The engine can be made with one, two or four cylinders, and though at present constructed as a four-cycle engine, can be arranged to work on the two-cycle principle, in which case a machine of 800 horsepower could be built. A horizontal cam shaft is provided, as with horizontal gas engines, and this operates the air inlet valve which is on the top of the cylinder, the exhaust valve which is at the bottom, and the fuel inlet valve which is on the end. A governor of the usual type is also worked from the main cam shaft, and it is noteworthy that in the case of two-cylinder machines (all over 200 horsepower being made with two cylinders) the same cam shaft can be employed for all the valves on both cylinders. In the two-cylinder type the fly-wheel is not between the cylinders, but outside, so that a four-cylinder machine would be constructed of two separate two-cylinder engines with the fly-wheel in the center. In order to reduce wear on the cylinder the pistons are made longer than in the vertical type, and the cylinder lining is of the best cast steel. The compressor is of the ordinary type, driven off the main cam shaft, and the air is cooled in a cooler behind the compressor before entering the air vessels. The cam shaft also drives a small oil pump, which provides the lubrication for the machine, the gear wheels running in an oil-bath. The cooling water flows both through the main cylinder jackets and also round the compressor cylinder, the amount being regulated by valves on each pipe; it is found that the cooling effect is most satisfactory. The fuel consumption is practically the same as for the vertical type, and economy can be effected at light loads in the case of large engines by cutting out some of the cylinders.

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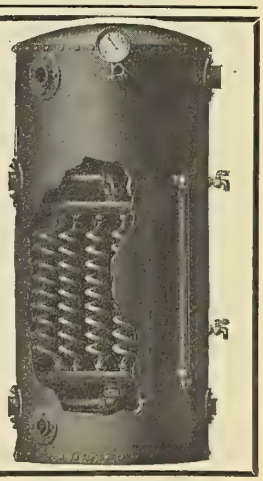

The Sanitary Water-Still Co. Jamaica, N. Y., U. S. A.

MESSRS. GEORGE G. BLACKWELL, SONS & COMPANY, LTD., the manufacturers of anti-friction metal, of Cross Lane, Eastcheap, London, E. C., have recently placed on the market the "Lion Brand" of plastic white metal. It is specially suitable for the main bearings and cranks of marine and other types of high-speed engines. The fusing point of this brand is 402 degrees F., fluid point 600 degrees F., specific gravity 7.8 and weight per cubic inch 0.2818 pounds. It is a tin-basis metal of the best class, containing over 80 percent tin and antimony, specially toughened, and will sustain a load of 6 tons per square inch. Messrs. Blackwell are experiencing a large demand for this metal in consequence of the unqualified satisfaction it has given wherever it has been adopted.

THE NEW PADDLE STEAMER *Weeroona*, which sailed at the end of September from Glasgow, temporarily strengthened and boarded up, on her voyage to Melbourne, shows clearly that for high-speed passenger day service the paddle is still favored. This vessel, which is 310 feet in length by 36 feet beam, 71 feet over the sponsons, and is certified to carry nearly 2,000 passengers, has been built by Messrs. A. & J. Inglis, Pointhouse, for service in Port Phillip Bay, South Australia. On the measured mile, as the mean of three double runs, she attained a speed of 18.1 knots, and the same rate of steaming was maintained in the Firth for about eight hours. She has spacious saloon accommodation on two decks for dining and lounge purposes, and on upper decks ample space and shelter for promenading. Ventilation has been specially looked to, and besides the fitting of closely spaced and large-sized side ports and sliding windows and of cowl and mushroom-headed ventilators, the thermo-tank system is installed for cooling the dining saloons, especially that on the lower deck. The apparatus is capable of changing the air in this large apartment fifteen times an hour. The medium used for cooling the air in this vessel—amongst the first so arranged—is sea water. Tests have shown that the air is delivered at practically the temperature of the sea water. On her station the vessel will be moving in water of a temperature at highest of 84 degrees F., and the saloon will always be kept at a temperature probably never more than 86 degrees F., this temperature being maintained under tropical conditions, when probably the atmosphere will be in the vicinity of 100 degrees F.

THE BRAZILIAN DESTROYER *Sergipe* recently left the yards of Yarrow & Company, Ltd., at Glasgow, to start on her voyage to Brazil, and the *Parana* left shortly before. These two vessels are the last of the ten destroyers ordered by the Brazilian government from Messrs. Yarrow, and their departure completes an important and efficient addition to the Brazilian fleet. In spite of the firm's removal from London to Glasgow during the early part of the execution of this work, the vessels have been delivered some months before the contract time.

A NEW TYPE OF LIFEBUOY, electrically lighted and designed for use in docks, on shipboard, and elsewhere where the work entails risk of danger by drowning, is being brought out by the Float Electric Company, Ltd. It carries four lights of 9 candlepower, two above and two below the water, which can be plainly seen in clear weather for a considerable distance. The lighting is effected by two Float primary batteries, which are so arranged that they are sealed until the buoy is lifted from its rack. That operation has the effect of lighting the lamps, and the buoy will remain illuminated when thrown in the water for three or four hours. Its weight is only 25 pounds, and in tests carried out at Barking it was found capable of supporting one man weighing 12 stone when lying across it, and three men when their weights were partly waterborne.

MESSRS. JOHN I. THORNYCROFT & CO., LTD., are completing at their Woolston Works, Southampton, three motor passenger boats, which have been ordered by the Governor of Baghdad for service on the Euphrates and Tigris. These vessels are 63 feet long over all by 9 feet 6 inches wide, and at full load and full speed draw 2 feet 6 inches of water. Their twin screws are driven by two sets of Thornycroft 47 brake-horsepower paraffin motors, running normally at about 500 revolutions per minute, but capable of being accelerated up to 800 revolutions per minute. A tank containing 60 gallons of paraffin is fitted in the steering platform. The motors are placed in the middle of the boat, the first-class accommodation, for thirty passengers, being forward, and the second class, for twenty, aft. At the full-speed trials of the first of these boats, which was finished complete in all respects in eight weeks from the time of laying the keelplate, a speed of 13.4 knots, or 1.4 knot more than was guaranteed, was obtained, the total displacement at the time being 12½ tons.

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PARK & PATERSON, LTD., of Parkhead, Glasgow, have removed their branch works from Salford, Manchester, to Vickers street, Miles Platting, Manchester.

THE GEIPEL "RAPIDITY" type of steam trap, made by William Geipel & Company, Vulcan Works, St. Thomas' street, London, S. E., is stated by the manufacturer to be the only reliable trap for high-pressure which is safe from explosion, and that more than 100,000 of them are in use all over the world; that it is employed both for the highest pressure and for the lowest; that it is used on vessels of war at 300 pounds upwards, and on marine engines for the valve chest receivers, jackets, main steam pipes and auxiliary steam pipes, and for many other purposes.

EXTENSIONS RECENTLY ADDED to the Landore works of the British Mannesmann Tube Company, Ltd., consist principally of a new building for manufacturing spigot and faucet tubes. Covering an area of about 6,000 square yards, it contains the necessary machinery for dealing with an additional output of 12,000 tons of tubes a year. Two railway sidings run the whole length of the building, and there is also an electric traveling crane by Messrs. Babcock & Wilcox, Ltd., of Renfrew. The tubes produced here are used for gas and water mains, electric cables, etc., and are made up to a total length of 40-50 feet, weldless, *i. e.*, in one solid piece. The total area covered by the Landore works now amounts to about 14 acres. Their output in tubing has increased sixfold in the last ten years, and the number of workmen at present employed is between 1,500 and 1,600.

WHEN THE LIVERPOOL MERCANTILE NAVIGATION ASSOCIATION decided to bestow their gallantry medal upon Lieut. J. O. Williams, R. N., they created a precedent. The exceptional services, however, of the gallant coastguard officer warranted them in departing from their usual practice of awarding the medal to masters and officers of the merchant service only. During the five years that Mr. Williams was stationed at Holyhead, he saved no less than 101 lives by means of the rocket apparatus alone. All through his thrilling career he never appears to have hesitated when his duty involved him in personal risk. He undoubtedly holds the premier position of lifesaver among British coastguards. His life, which has recently been published by Hodder & Stoughton, of London, under the title of *The Hero of the Sea,* is worth reading. An excellent account of the development of the rocket apparatus prefaces the biography.

DIVING APPARATUS AND SUBMARINE APPLIANCES are made by Messrs. Siebe, Gorman & Company, Ltd., 187 Westminster Bridge road, London, S. E. The firm's well-known air pumps, diving helmets and dresses, diving bells and accessories, including electric lamps, telephone apparatus, pneumatic tools, exploders for blasting, etc., an interesting self-contained breathing apparatus, capable of being used as a smoke-helmet or for diving in shallow water, are among its products. This consists of a helmet and jacket, and in a pocket is a substance which, in contact with the respired water vapor, gives off pure oxygen. The residue is an alkali, which absorbs carbon dioxide, and it is said that the air contained in the apparatus can be breathed over and over again, and light work can be carried on for about an hour with one charge.

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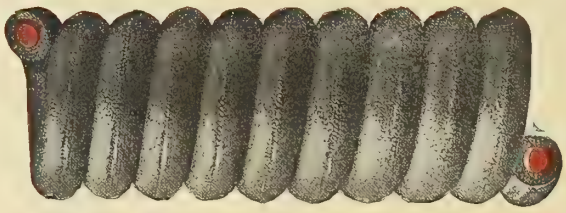

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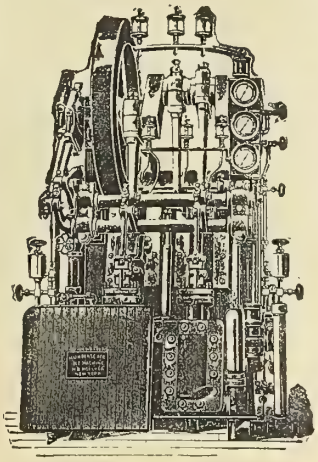

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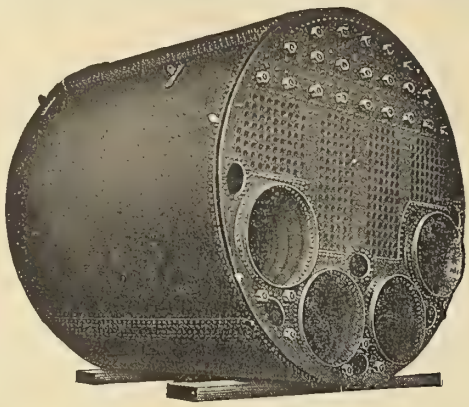

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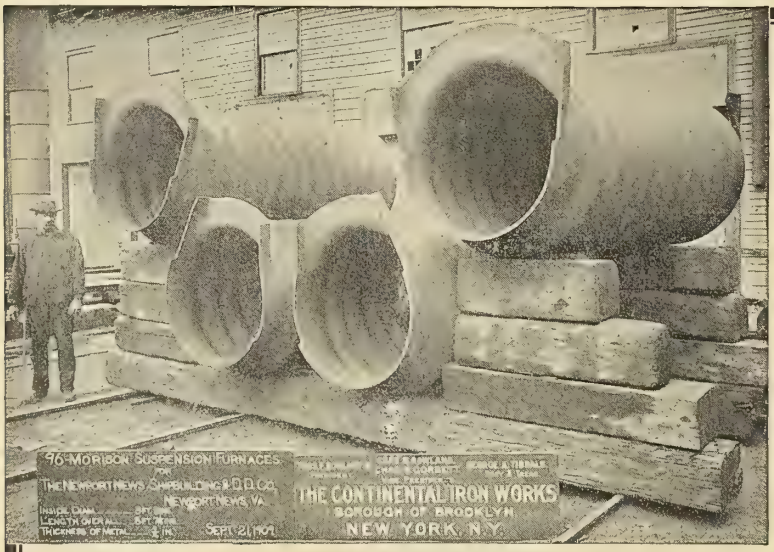

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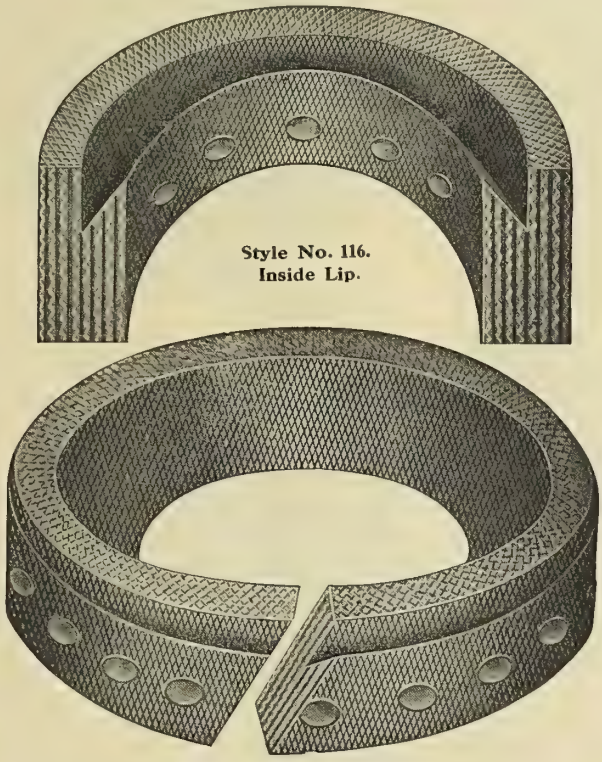

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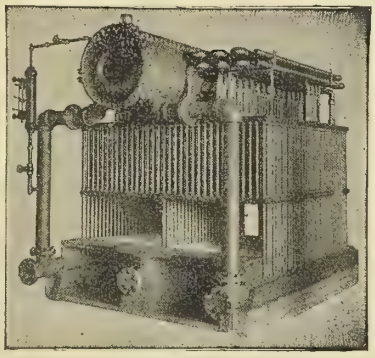

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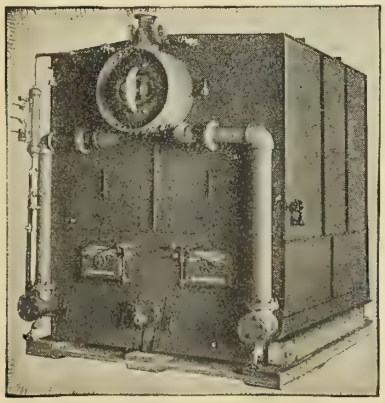

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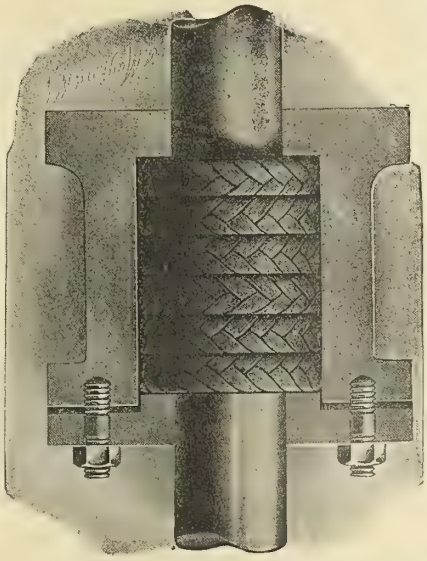

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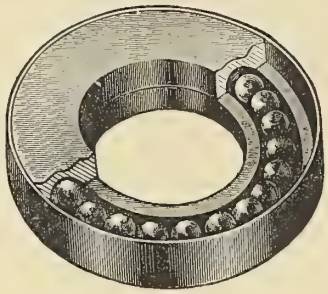

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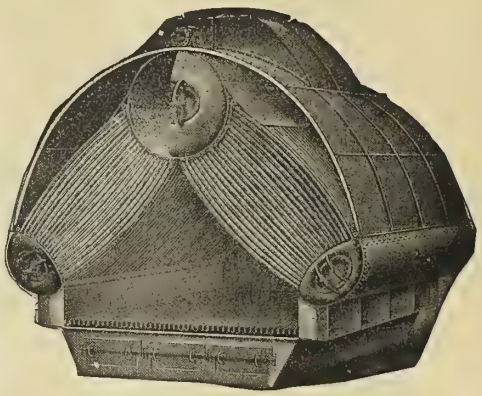

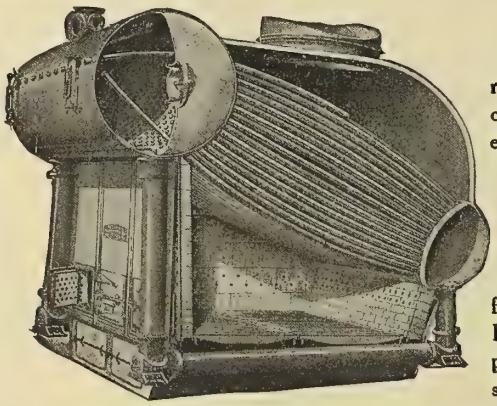

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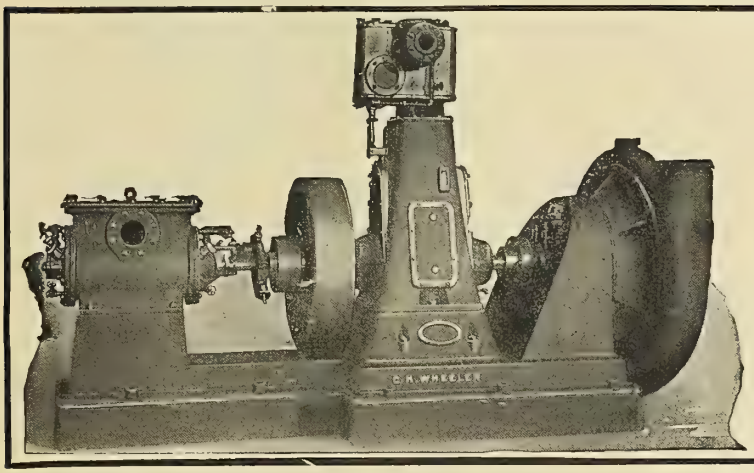

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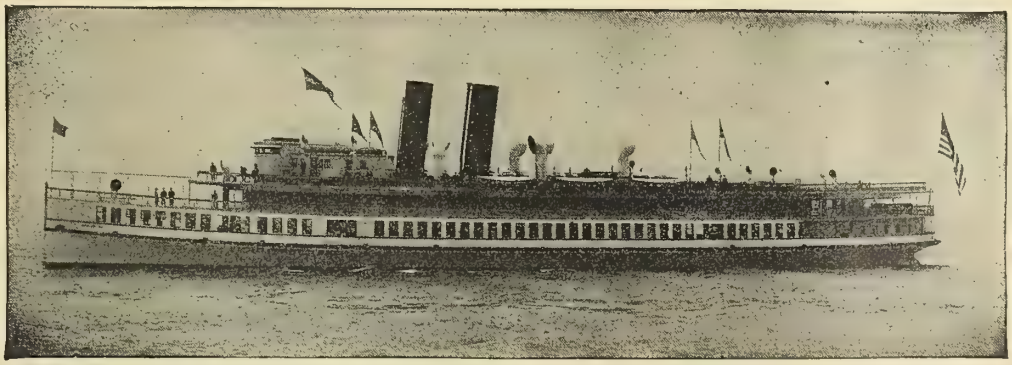

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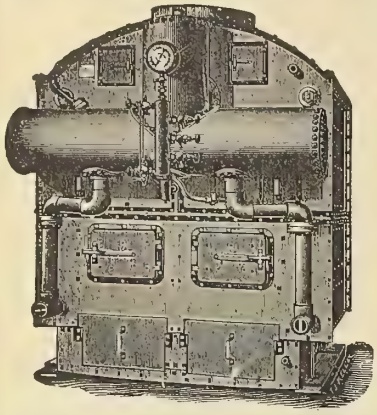

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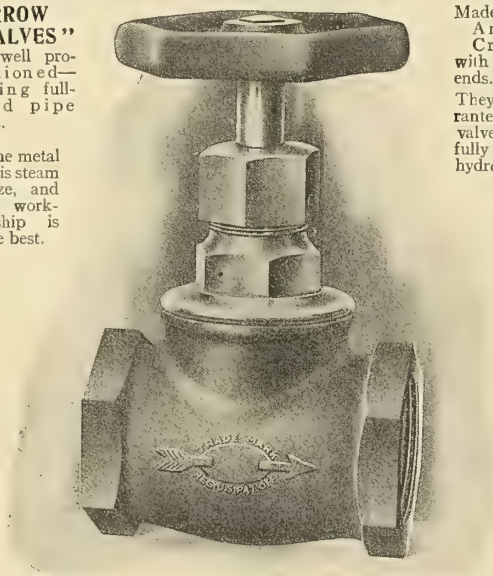

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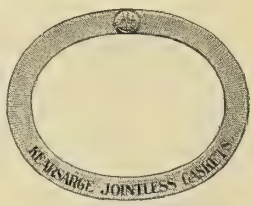

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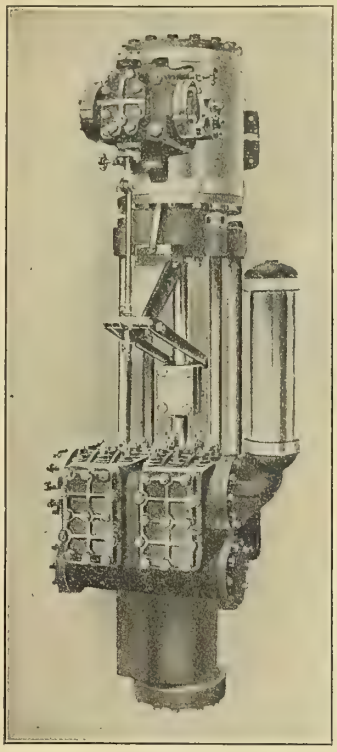

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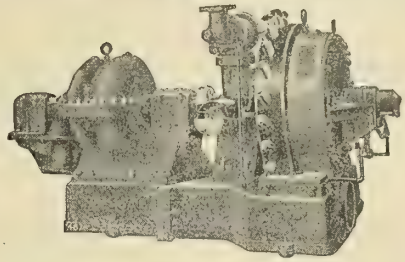

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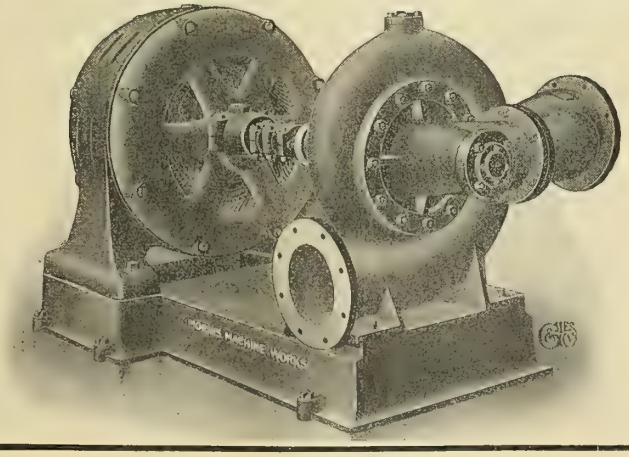

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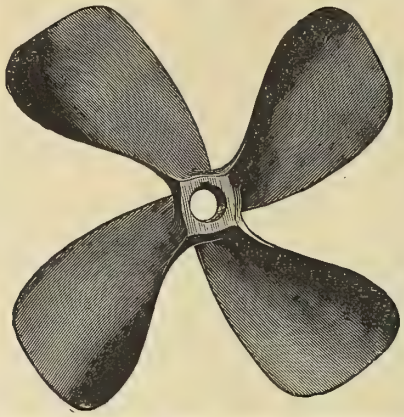

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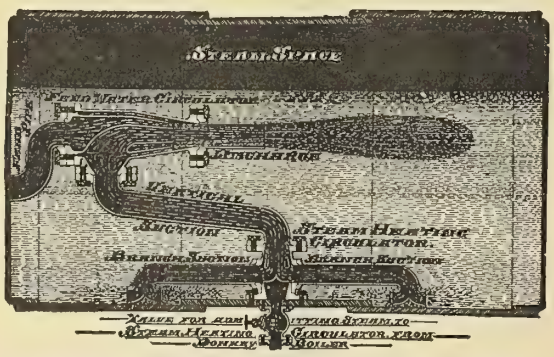

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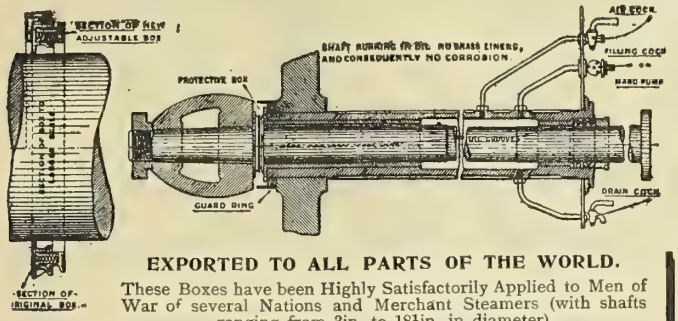

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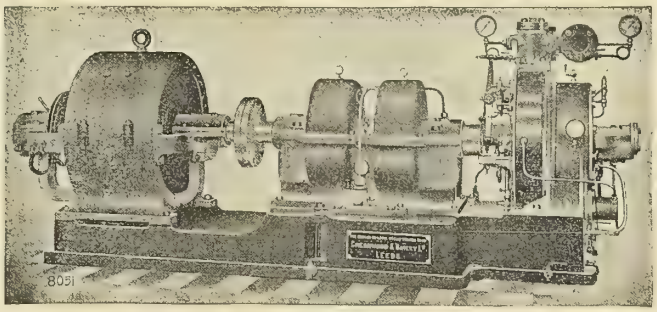

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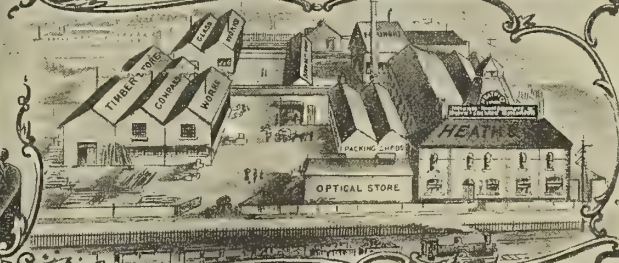

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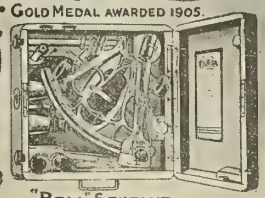

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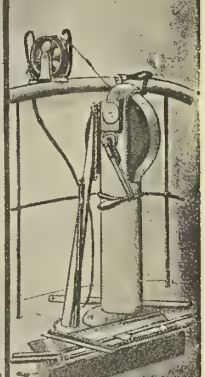

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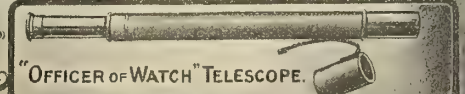

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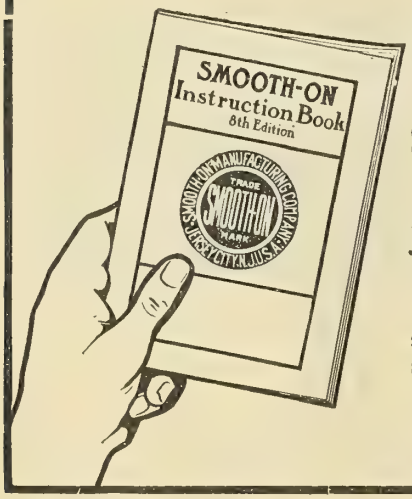

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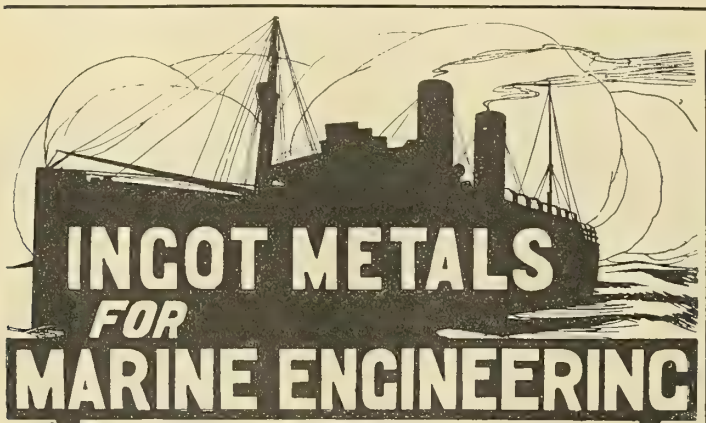

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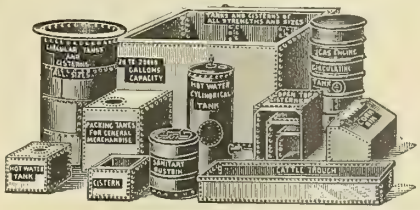
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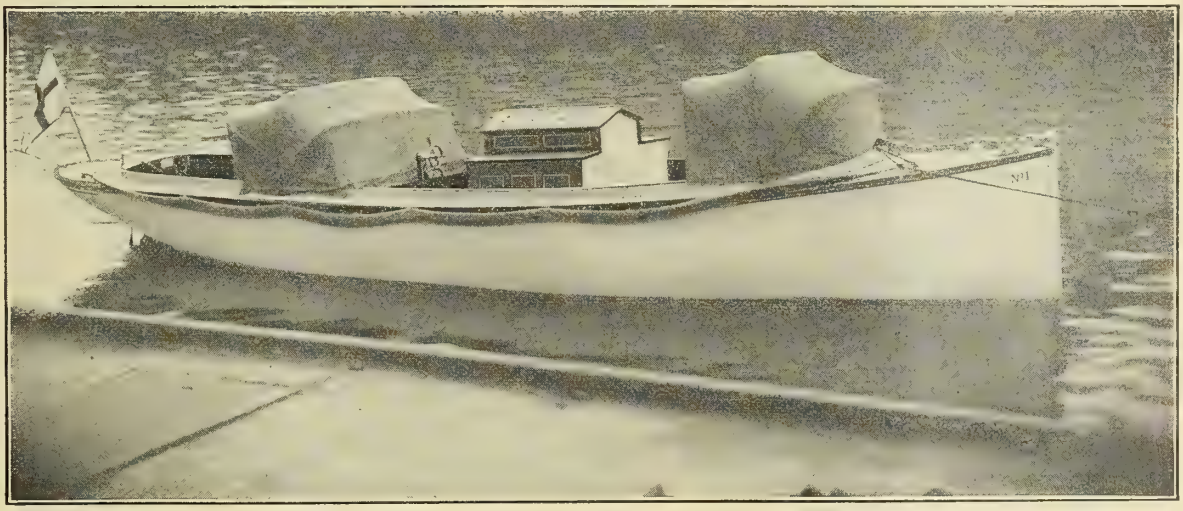
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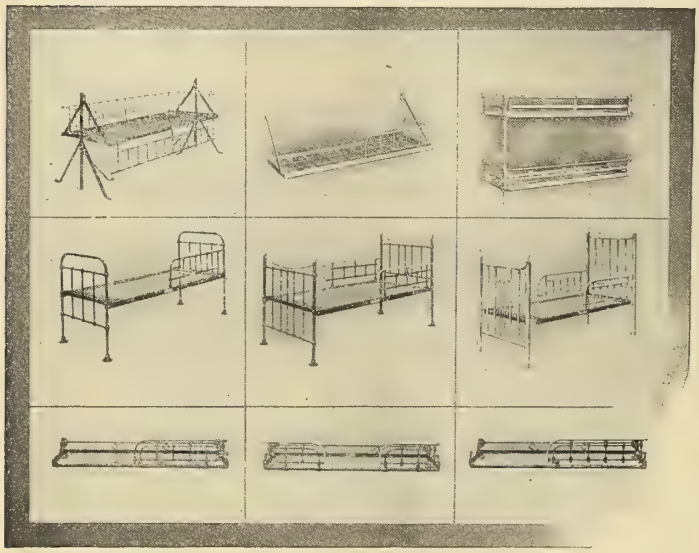

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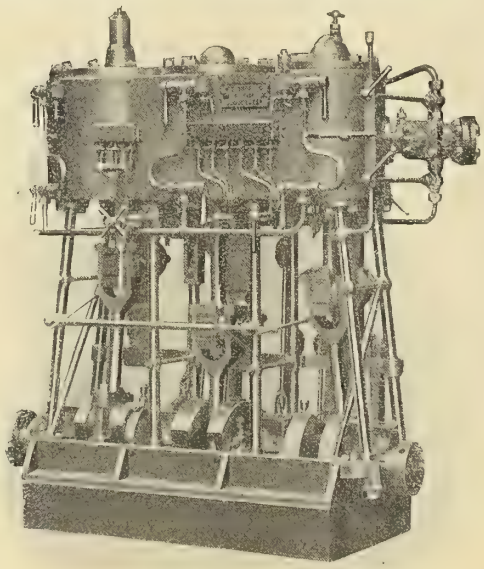

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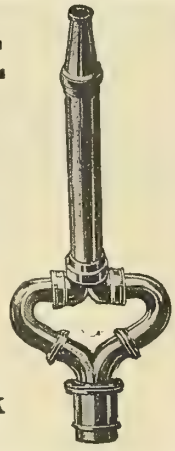

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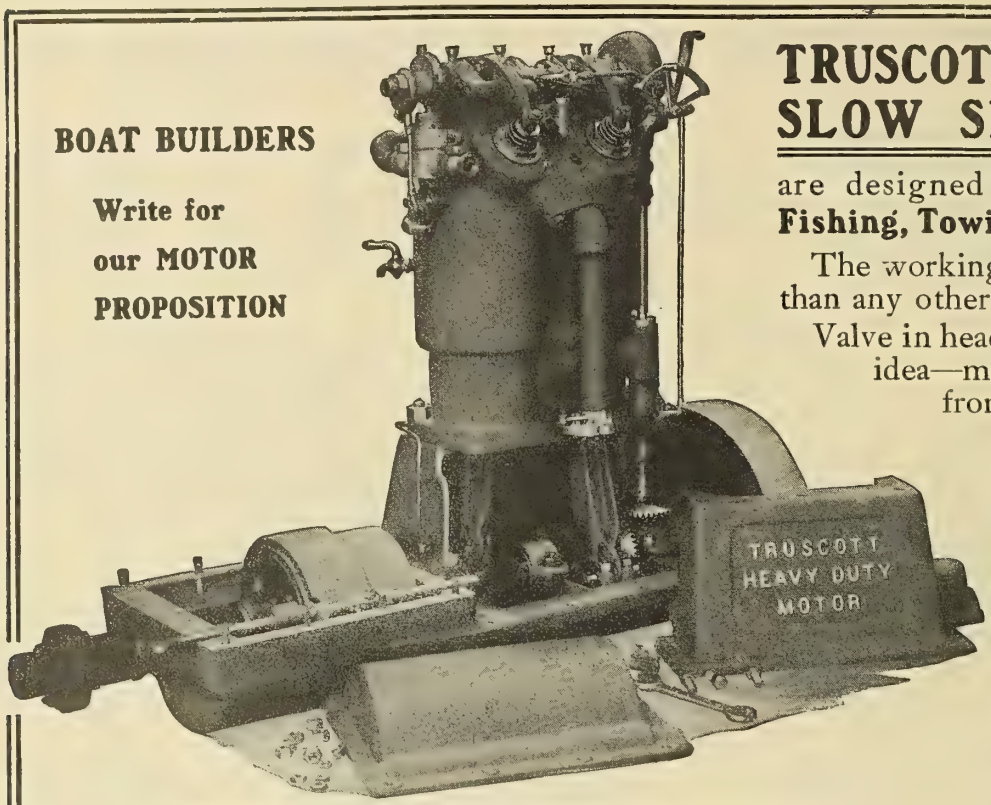

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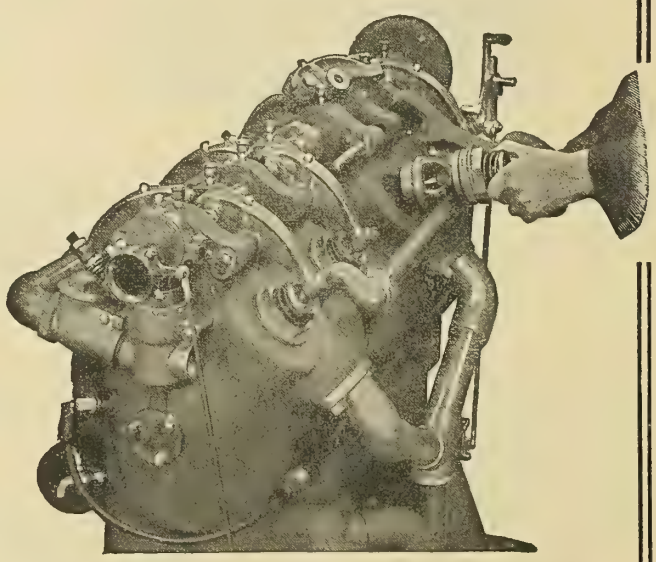

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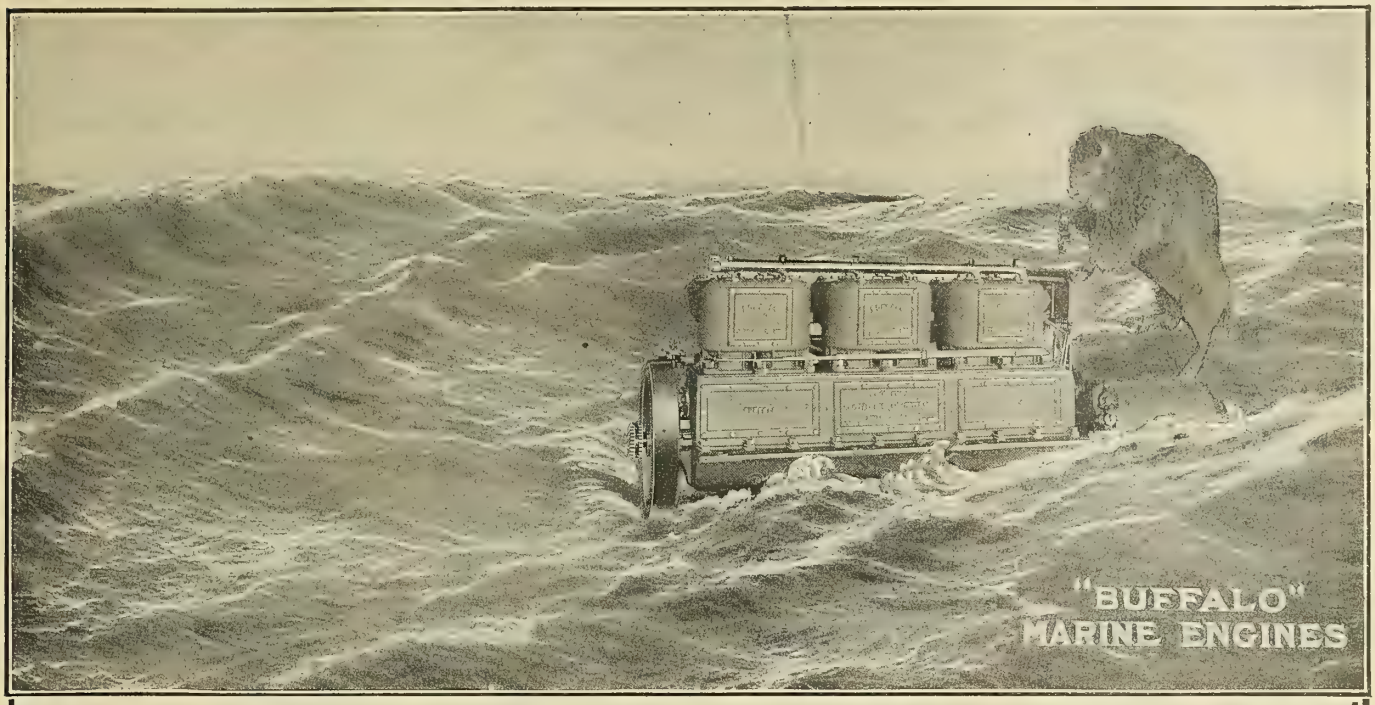

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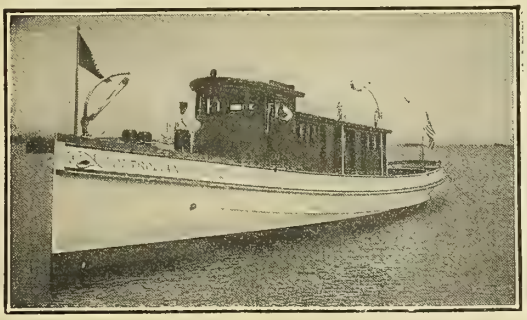

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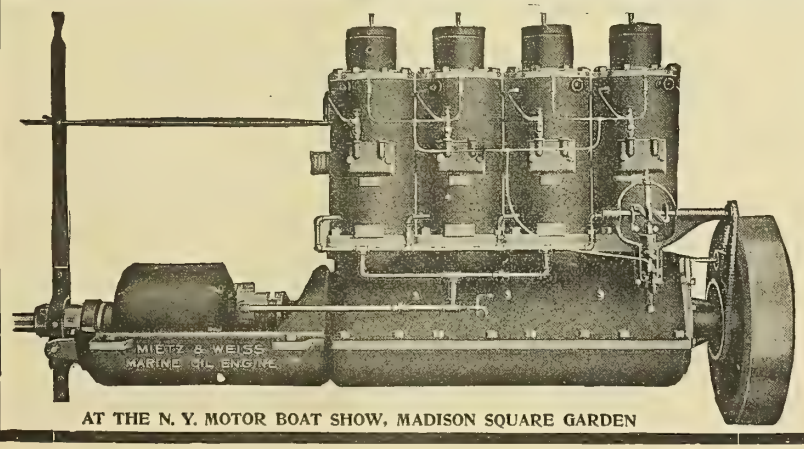

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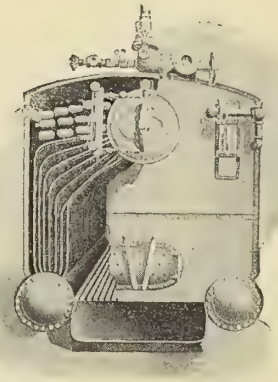

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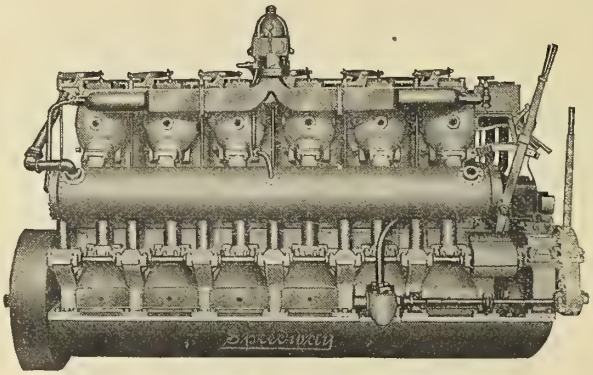

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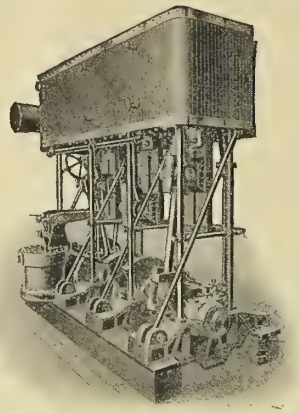

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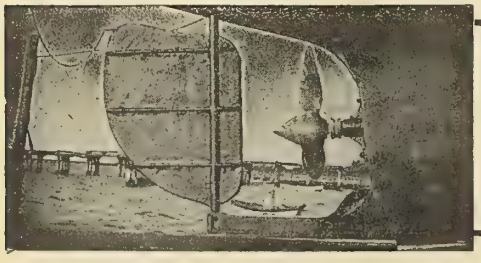

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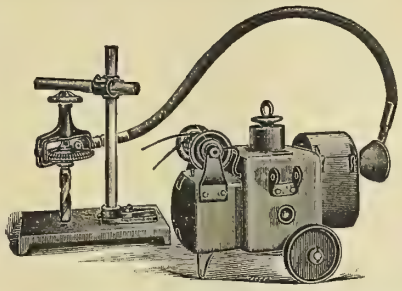

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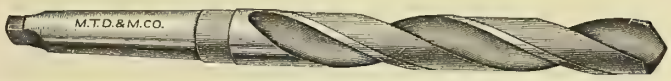

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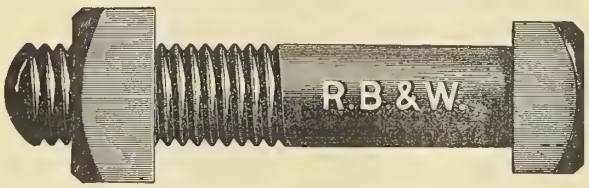

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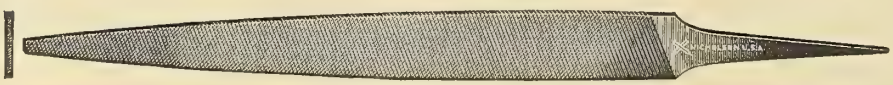

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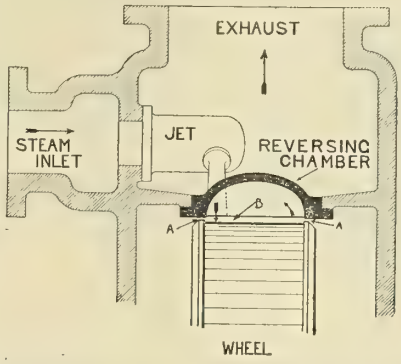

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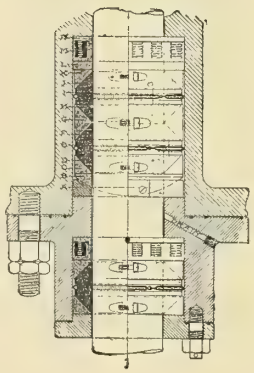

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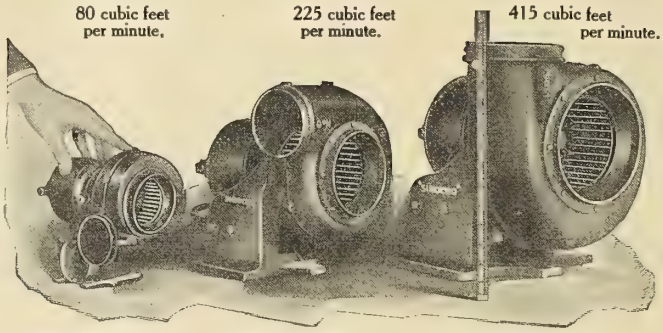

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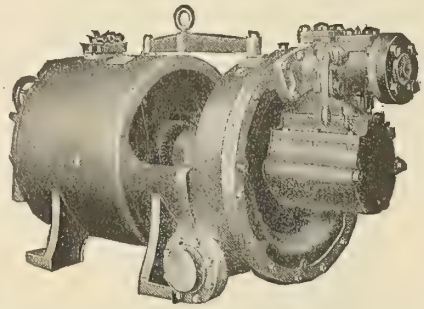

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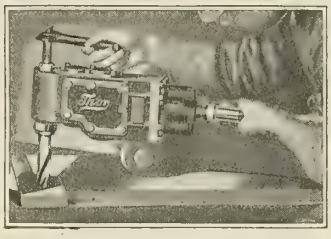

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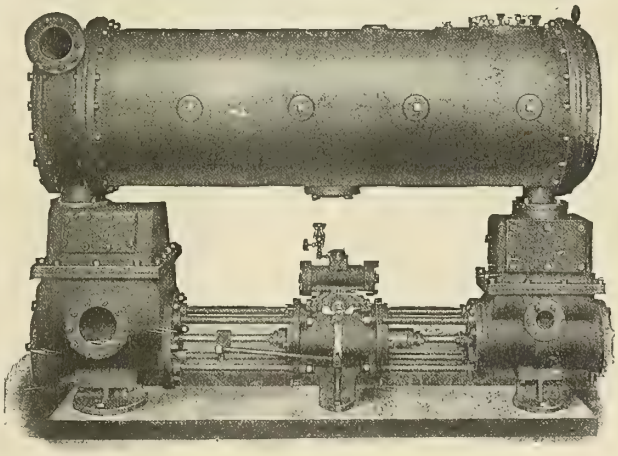

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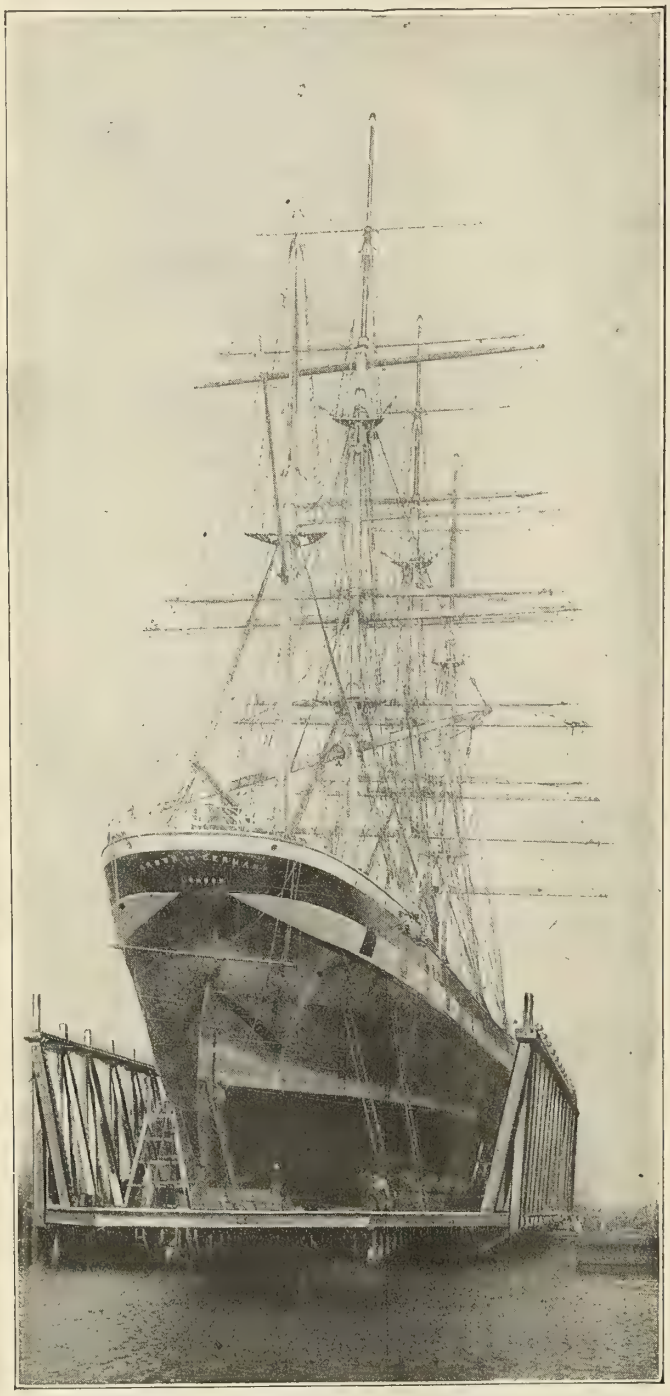

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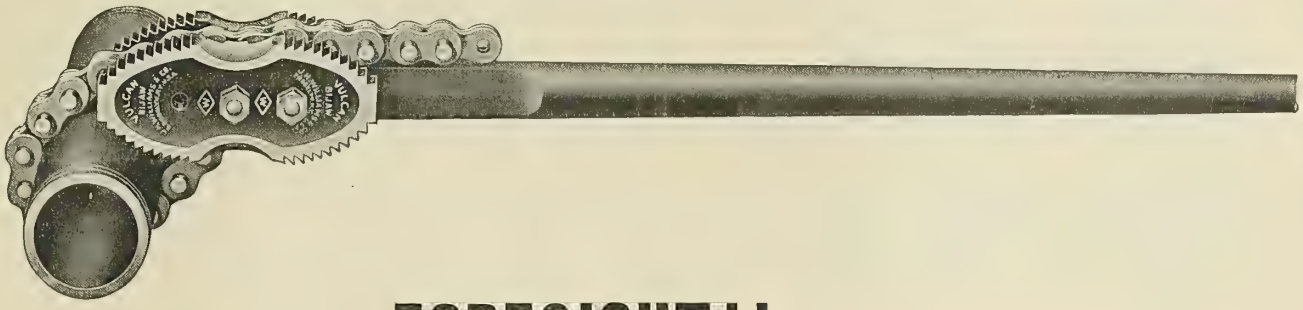

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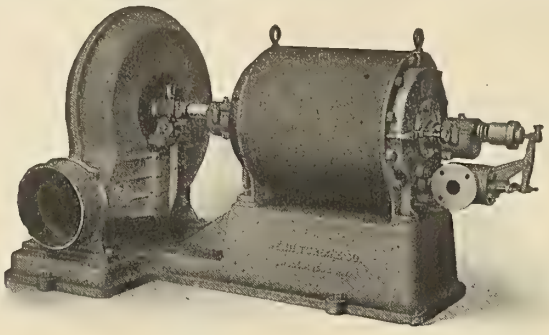

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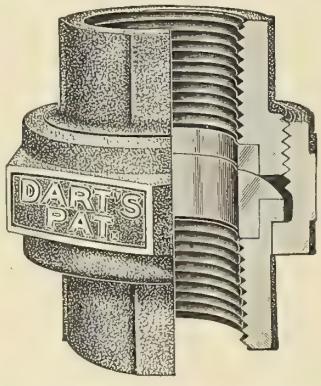

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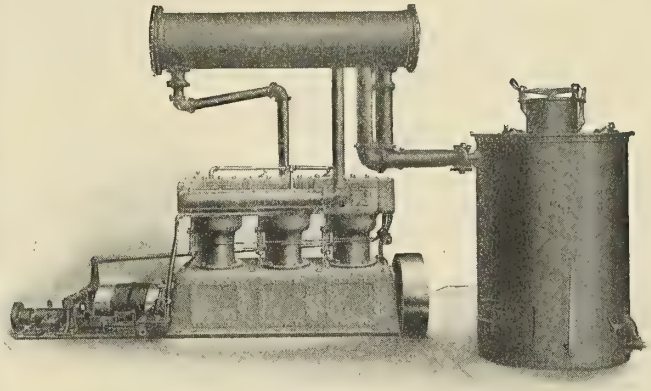

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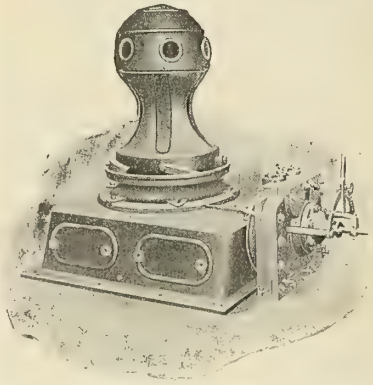
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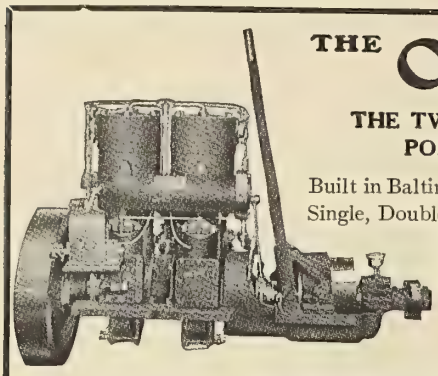

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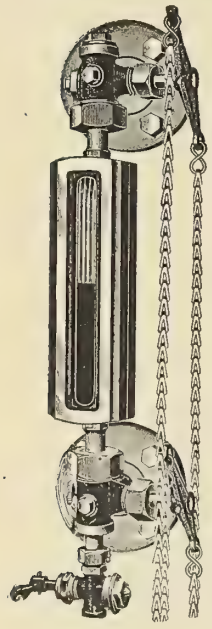

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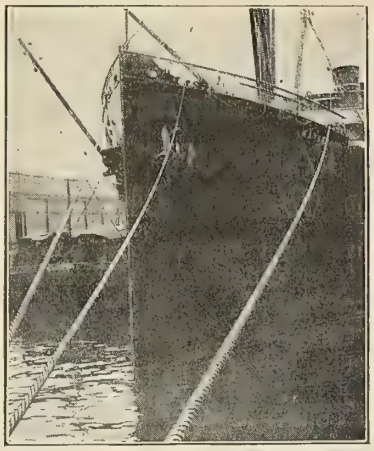

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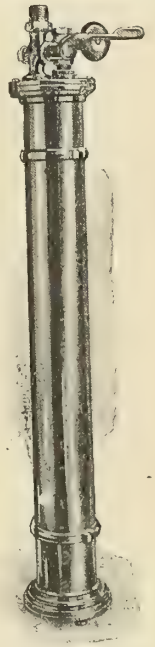

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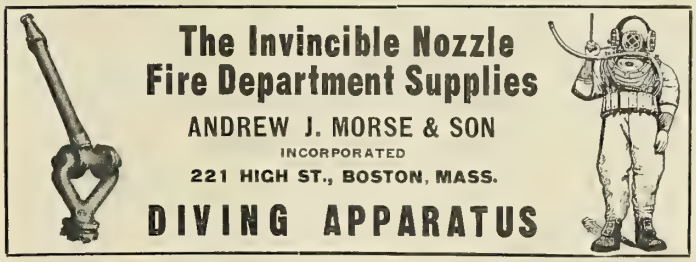

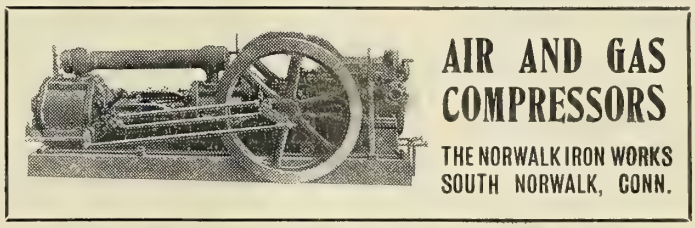

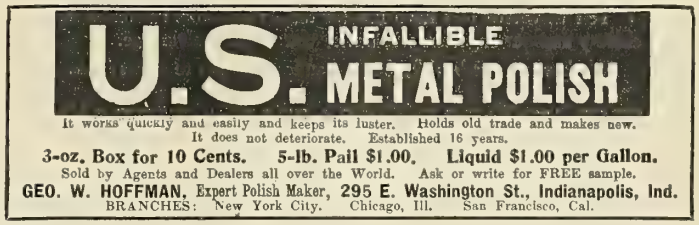
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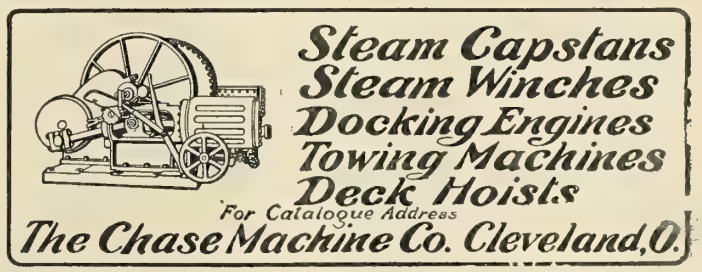

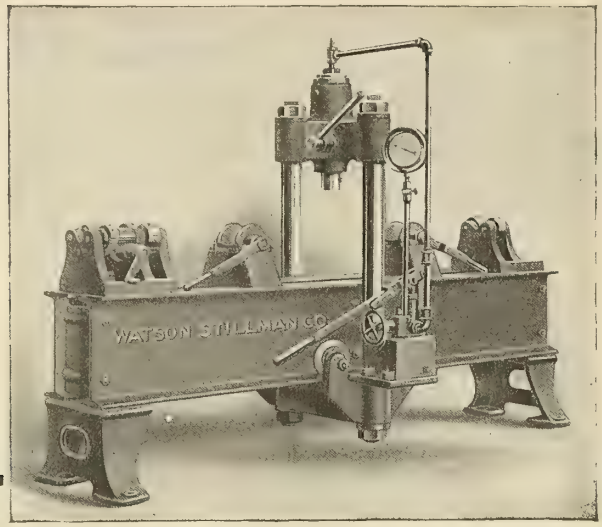

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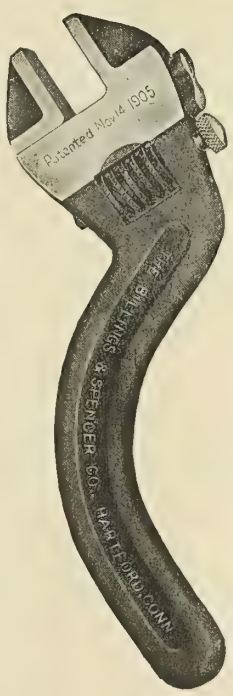

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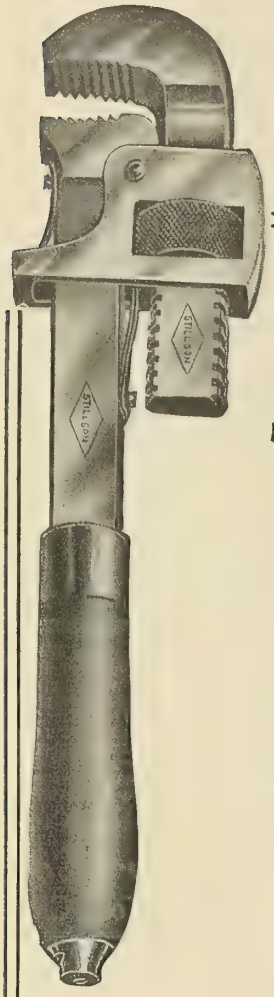

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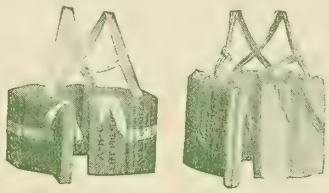

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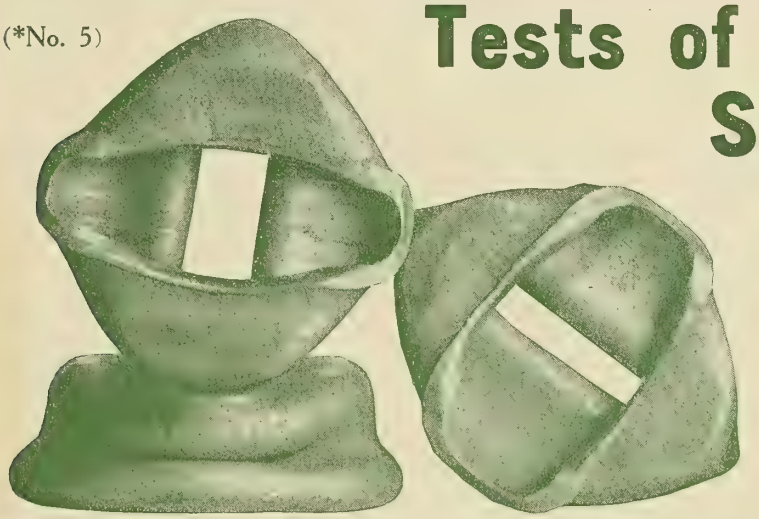

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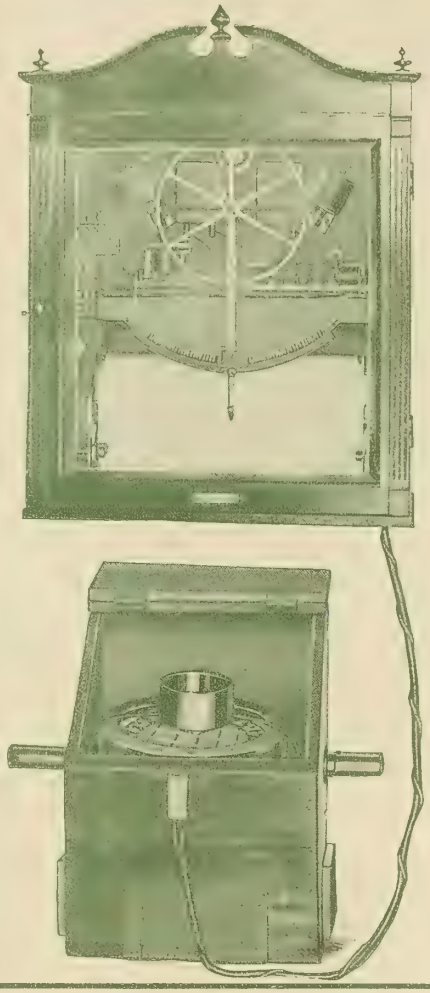

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